This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Treatise on Ships' Cables.

BY

GEORGE PEACOCK, F.R.G.S.

600018092Q

A Treatise

ON

SHIPS' CABLES

WITH

THE HISTORY OF CHAINS

THEIR USE AND ABUSE,

FROM THE EARLIEST PERIOD DOWN TO THE PRESENT DAY.

BY

CAPTAIN GEORGE PEACOCK

F.R.G.S.

LONDON:
SIMPKIN, MARSHALL & Co., STATIONERS' HALL COURT,
1873.

231. g. 33

ERRATA.

Page 23, thirteenth line from the bottom, for "of Jehovah," read of *their* Jehovah; and in next line, for "their" read *such*.

Page 23, eighth line from bottom, for "fidei" read *fide*.

Page 51, eighth line from top, at the end of "Ships" insert—with the exception of *one* smaller *working* anchor and cable.

Page 55, thirty-fifth line from top—at the end of "bottom" insert—they even prove to be a source of weakness and destruction!

Page 56, at end of bottom note—insert "The same weight of iron required for these midship bulkheads or even *half* the same weight brought on inside the frames above and below the hold beams, as additional *thick* plate *stringers*, fore and aft, would be of great service in preventing a stranded ship from breaking up so quickly."

Page 57, third line from bottom for "carryiug" read *carrying*.

Page 59, sixth line from top, for "interstics" read *interstices*.

Page 60, eighteenth line from bottom, instead of "?" read "!"

PREFACE.

Courteous Reader,

The author of this little Treatise—an old Sailor, steam officer, and amateur naval constructor—having had to overhaul a number of old works to hunt up data for the early history of *chains* and *chain cables*, acknowledges without any apology, the borrowing of the above trite style of address peculiar to prefaces of the seventeenth and eighteenth centuries, and does not see why such a polite mode of respectful introduction to the public should be considered *obsolete* in the present day, inasmuch as every reader of the preface of *any* book must necessarily be *courteous* by so doing.

It has been said by more than one of our ablest writers, that the *preface* of every book worth reading, ought to be read, if no other of its pages, in order to give one an idea of its contents; although it is also said that very few prefaces are ever read by sensible people! Should the author, however, be fortunate in this respect, it will, most probably, be remarked that there are a great many digressions in his little work:—no doubt there are, but it must be borne in mind, that a *cable*, whether of hemp, chain, or wire, is but a dry subject out of water, at the best, not excepting even that vast telegraphic *cable* itself, now on board the "Great Eastern" which our Transatlantic cousins facetiously designate the "*mortal coil*," and all the various digressions that will be found are, he ventures to suggest, more or less *links* in the *chain* of history, "ancient and modern"—some relevant, and some, no doubt, very irrelevant to the subject; "be that as it may"—to borrow another antique aphorism—the author trusts, that by having introduced a few noteworthy remarks on past and present events, as to the use and abuse of *chains* from the earliest period downwards, they may, to a certain extent, be considered interesting to the said Courteous Reader.

It will probably be thought "passing strange" that the Gallic Britons, (no doubt, synonymous with the *ancient* Britons,) according to the authority of Sir Walter Raleigh, should have been the first inventors of chain cables for ships some 2000 years ago! Sir Walter, on introducing the subject in his "Discourse on the First Invention of Ships," (see pages 26 and 27), does not even express any surprise as to the novelty itself, but seems rather to consider it rude and barbarous of our fore-fathers; for having invented this "*furniture*" they had to build "untoward tubs" with "high heads" accordingly, in order to prevent their bows being submerged: Surely, with all due deference to the opinions of this great and excellent Seaman, they should not have been blamed for this fore-thought, but the contrary, revolving turrets with guns not being known at that time; and this hint it seems to "the undersigned"—might have been taken advantage of in constructing the huge iron-clad "Monitors" lately built in our Royal Dockyards; for these terrible looking monsters if ever *they* should be compelled to anchor in deep water as the Channel Fleet "was wont to do" in Lord St. Vincent's day, blockading Brest, &c. (the very coast of the old daring "Veneti" —or *Vanneti*—of Brittany), in a westerly gale with the whole fetch of the Atlantic Ocean to windward, their bows must inevitably be submerged, and they might *possibly* also do as Sir Walter says the "untoward tubs" of our ancestors *would* have done had they not had the "high heads." On examining these modern built *Monitors* one is induced with all due deference to ask why their forecastle and quarter-decks should have been placed so far below the horizontal line of the turret port cills?—for having no bulwark, bowsprit, or extraneous gear beyond the *anchors* themselves, which being Martin's patent, lie flat on the bill-boards, there seems to be nothing to obstruct or intercept the line of fire from *either* turret, for the same may be said of the *after* part which, in a pooping sea, it is reported (with the "Devastation" and other *Ships* of this class in their recent trials even in moderate gales) are flooded, owing to this "*untoward*" depression of the forecastle and after-deck some eight feet below the level of the main-deck, without any obvious reason; inasmuch as the superstructure to the level of the main-deck need not have been shot proof any more than the "hurricane *building*" itself.

The hint of Sir Walter Raleigh respecting the views on this head of the ancient Britons or, at all events, of the ship builders of *Vannes* some fifty or perhaps a hundred and fifty years before the Christian Æra, may *yet* not be thrown away upon our present enlightened and *practical* first Naval Lord of the Admiralty, and the talented Triumvirate of Naval Architects in the Controller's Department.

Before concluding, the author takes the opportunity of acknowledging the obligation he is under to Messrs. Brown, Lennox & Co., for most of the information respecting the early career of the modern *practical* Inventor of *Chain-cables* and Founder of their great Firm, the late Captain Sir Samuel Brown, R.N.; and with these few remarks, begs, most respectfully, to subscribe himself the Courteous Reader's very humble and most obedient Servant "to command,"

GEORGE PEACOCK,
Formerly a Master in the Royal Navy.

Regent House, Starcross, Devon,
9th June, 1873.

Treatise on Ships' Cables.

The origin of the word Cable is derived from the Hebrew *chebel*, signifying a cord or rope, or from the Arabic word *habl*, pronounced khable (the *h* guttural as in Spanish), also signifying a cord or rope; in Latin *camelus*—hence the excellent metaphorical simile of our Saviour when preaching on the coast of Judæa, beyond Jordan, in reference to the eye of a needle, wrongly translated a *camel*, in the New Testament.*

Cables were formerly made from flax or hemp, and must have been well-known to the ancients. In China cables are made of rattans, also of a very large hemp peculiar to the country, and bass or coir fibre; amongst the Indians in the Chiloé Archipelago

---

* Commentators are divided in opinion on this point, some arguing it to have reference to a low gateway in Jerusalem called the Needle's Eye; but it is supposed that the name of this gate was made for the occasion at a subsequent period, for even had such a gate existed at the time of our Saviour, the simile would hardly have been understood by the inhabitants of that remote part of Judæa, whereas the *cable* and the needle would at once be familiar objects to their senses; and as, no doubt, according to Theophylact, the Hebrew word חבל (*chebel*) was used by our Lord (translated afterwards by the Latins into *camelus*) it should have been accepted *cable* and not (גמל) *camel*. Aiguille, in French, for instance, signifies both a needle and a church spire or obelisk, yet it would be the height of absurdity to translate a sail-needle into a church steeple, or a netting-needle into an obelisk.

(S. America), the author has seen their canoes moored with the stems of a climbing plant of the wild vine species, which is very tough and supple and of great length; their anchors being part of the branch of a hard wood tree, cut with three forks like a grapnel, and a stone lashed between them, larger or smaller according to the size of the canoe.

Acts of Parliament were passed in England during the sixteenth century to prevent the exportation of hemp, which, in the reign of Henry VIII., was largely grown for manufacturing ships' cables near Bridport. By a statute of 21st Henry VIII., c. 12, s. ii., we read as follows, viz.:—"No person dwelling within five miles of the town of Bridport, in the county of Dorset, shall sell out of the market holden within the said town any hemp which shall grow within the said five miles, upon pain of forfeiture of the hemp." Sec. iii., "No person other than such as shall dwell within the said town shall make out of the said town any cables, &c., made of hemp within the said five miles, upon pain of forfeiture of said cables, &c.;" and by the 35th of Queen Elizabeth, c. 8, s. iii., "If any person shall make cables of any old or over-worn stuff, which shall contain above seven inches in compass, every one so offending shall forfeit four times the value; and if any person shall tar any halsers or other cordage, made within this realm of such old and over-worn stuff, being of lesser assize and not containing in compass seven inches, and by retail put to sale the same being so tarred, every person so offending shall forfeit treble the value, &c., and be imprisoned during her Majesty's pleasure."

By this stringent Act of Queen Elizabeth, it may be inferred that *shoddy* cables for fishing vessels and others were at that period more or less manufactured, and probably loss of life had ensued to this valuable class of her Majesty's subjects, hence the good Queen

Bess herein displayed that interest in the lives of her sailors and fishermen, which is a characteristic attribute of our present most gracious and excellent

SOVEREIGN LADY-QUEEN VICTORIA.

But, notwithstanding all this fostering care of the Government, it was found that, as years rolled on, England could not supply sufficient hemp for her requirements, and in 1763 the quantity imported from Russia, Holland, and Italy was upwards of 11,000 tons. In 1785 some 18,000 tons were imported from Russia alone, which in a few years afterwards rose to over 58,000 tons. In 1787 a bounty was allowed of forty shillings per ton upon all hemp grown in England, and a heavy duty placed on all foreign hemp imported into this country. A first-rate ship of war at that time required upwards of eighty tons of hemp for her cables, sails and cordage. It is said that at the close of the eighteenth century, France alone, in one year, used up some 200,000 tons of hemp![*] and as the navy of England was equal, if not superior, to that of France after the war broke out in 1796, how great must have been her consumption of this important article at the height of the French and Spanish war in 1805! and this brings us to the introduction of

CHAIN-CABLES.

It is difficult to assign the exact period when chain-cables for ships were first actually introduced, or by whom first really invented. According to the archives of the Patent Office a patent was obtained in the year 1634 by an Englishman named Philip White, a blacksmith, "for a way fŏr the mearing of shipps with iron chaynes by finding out the true heating, p'pareing, and temp'ing of iron for that purpose; and that he nowe attayned to the true use of the said chaynes, and that the same will be for the great saveing of cordage and safety of shipps and will redound to the good of our co'mon wealth." But it does not seem that Philip White made much if any progress with his patent, which was perhaps only intended however for harbour moorings; and it is highly probable that the great French Circumnavigator Bougainville was really the party who first proposed the use of chain-cables on shipboard, after returning from his celebrated voyage round the world in 1767-8-9. It is supposed that the importance of having chain-cables was impressed upon this practical and excellent officer by the chafing of hempen cables and loss of anchors amongst the coral reefs where his ships, 'La Boudeuse' and 'L'Etoile,' occasionally anchored off the shores of New Holland, New Guinea, &c.; and he had no doubt heard of his contemporary, Captain Cook, having suffered similar losses—as well as Commodore Anson, some twenty-seven years previously at Juan Fernandez and Tinian. It was in the year 1771 that Mons. Bougainville is said to have first proposed chain-cables on board ship, and he lived to see his grand idea carried out in practice on board an English merchant ship called the 'Penelopé,' commanded by Lieutenant Samuel (afterwards Captain Sir Samuel) Brown, R.N., in 1809-10. Mr. John Slater, a surgeon in the Royal Navy, had previously taken out a patent for chain-cables either in 1804 or 1806, but was not able to work it out. Lieut. Brown then took the matter in hand, as a practical sailor, in 1808—seeing of what immense advantage the introduction of iron cables would be to the Royal Navy; and it is said that this energetic young officer, "who had served with Lord Cochrane in H.M.S. 'Imperieuse,' shut himself up in two small rooms in Dove Court, Lombard Street, in close study, until he had matured his scheme, and was able to obtain a Patent for his peculiar method, which it would seem was a half-twist. But being unable to carry out his plans at his own expense, for want of funds, several of his relations and friends came forward to assist him, and the result was the fitting out of the good ship 'Penelopé,' which ship he took the command of on a voyage to the West Indies." She was not only fitted, it appears, with chain-cables, but also with a good deal of chain running rigging, and the results of the trials on this voyage proved a great success; so that "the Navy Board at once took it up and ordered a chain-cable (but without a twist) to be put on board H.M.S. 'Crescent' during that year (1810)." No doubt this trial also proved a complete success, for Lieut. Brown, who had been removed from the list whilst perfecting his plans, was now reinstated and "made a Master and Commander for the invention and its *practical* introduction in August, 1811;" and H.M.S. 'Crescent' became the first ship of war in which a chain-cable was ever fitted. Poor Bougainville died in 1811 without seeing his idea introduced into the French Navy. Captain Brown, it is said, wrote a pamphlet on the subject about this time, but the author of this treatise has been unable to learn the name of the publisher, or to obtain a copy of the pamphlet.

---

[*] France and Spain were then in alliance against England, and Spain at this time was probably supplied with hemp through France for her enormous fleet.

The 'Crescent' being only a small ship comparatively, it was considered that the size of chains for large frigates and line of battle ships would be too difficult to handle; but Captain Brown, quite equal to the occasion, and nothing daunted, manufactured a chain-cable of sufficient size for a line of battle ship during the year 1811. In the early part of 1812 it was tried on board H.M.S. 'St. Domingo,' bearing the flag of Sir Richard Strahan, who had been appointed to the command of a squadron for blockading Flushing. By the politeness of an old naval officer, residing near Starcross, who does not wish his name to appear, the author learns that he was at that time mate of the main deck on board the 'St. Domingo' when Captain Brown came on board with his chain-cable, the ship then lying in the Downs; that to the best of his recollection it worked very well, and the old hands on board thought highly of it for single anchor, but had their doubts about it for mooring in a strong tide way like the Downs; he thinks it was not retained in the ship. The author has a perfect recollection, when a boy, of the early trial of a chain-cable on board a line of battle ship at Chatham in 1812 or 1813, being present at the trial with his father, the late R. G. Peacock, a Master, R.N., of 1796, then commanding H.M.S. 'Glatton' at Sheerness. Being considered such a wonderful invention at the time, it has left a vivid, youthful recollection of the fact and date of the year on his mind, although he has no idea what the results may have been at the time, nor does he recollect the name of the ship, or any particulars, beyond the circumstance that a number of Russian officers were present from the Russian fleet then lying in the Medway, and that *they* declared in favor of hemp, which, of course, was a natural conclusion.

The difficulties of bitting and veering at that time were no doubt great; but like all other new inventions, when first put to practical use, difficulties will naturally present themselves—which difficulties, however, although at the time considered insurmountable to ordinary minds, only bring out the scientific genius and practical resources of the brain in the *genuine* inventor to overcome—adding fresh laurels to his brow!

In this category we may place Arkwright, Watt, Stephenson, Brunel, and a host of other eminent men of engineering talent, both living and dead, who have, as it were, by inspiration, contributed towards the great advantages and proud position of their native country, as well as the benefit of mankind in general throughout the world. "In the year 1816, Captain Brown established a firm in Liverpool as Brown, Logan and Co., having taken out another patent for manufacturing chain-cables by a new process, cleverly winding the red-hot bars of iron on a mandril, and then cutting them into links of uniform length and size. In 1817, Acraman and Sons set up a chain-cable manufactory at Bristol, and in the same year Messrs. Hawks and Co., at Gateshead. In this year, chain-cables were partly established in the navy, some ships being allowed to have one cable of iron and two of hemp;" it was, however, soon discovered that these did not naturally agree together (affording abundance of junk for the boatswain) yet it was not until the year 1830, that this excellent invention may be said to have become fully established in the navy. H.M.Stm.V. 'Echo' had chain-cables in 1828, and the flag-ship 'Winchester' (in 1829) had two chain-cables, with one hempen sheet cable, when the author went out in her to the West Indies on promotion; and in a merchant ship he served his apprenticeship in, the hempen cables were landed in 1822, and chain-cables substituted; at this time, however, they were far from being general in the merchant service. "In 1823, the Trinity Board first adopted them for light ships. Messrs. Acraman and Sons took out a fresh patent in 1820, and a Mr. Sowerby in 1822. In 1828, John Hawkes is said to have patented a cable much the same as Acraman's;" but none of these latter patents, like the two first named were ever brought into practical use, unless

Philip White's for harbour moorings; and Captain Brown having entered into partnership with Mr. Lennox, his plan and workmanship being considered the best extant, continued to manufacture chain-cables for the Royal Navy *exclusively*, during the continuance of his patent rights, and was at length rewarded for his indomitable perseverance, industry, and energy, by being created Sir Samuel Brown, and, it is said, also amassing a considerable fortune. "The cost of chain-cables when first introduced was enormous, as much as £112 per ton! having been paid both by the Navy Board and the East India Company, &c., but from 1814 to 1820 the prices varied from £80 to £60 and £42 per ton, the last price remaining in vogue for several years," but owing to the reduced price of iron, competition, &c, *good* chain cables are now to be had for about from £30 to £35 a ton, and some *shoddy* makers, it is said, can or *could* produce cables *with a certificate* at a considerably less price! (See pages 40 to 44.)

Captain Brown, like all enterprising men of genius, ability, and intelligence, had, however, to put up with the jealousy and envious opposition of rivals. "A Mr. Brunton, who was his clerk, at the instance of Fuller, his foreman, took out a patent for making chain-cables in 1813, and set up an opposition manufactory in the Commercial Road as Brunton, Middleton and Co., (Fuller becoming their foreman*), and although this firm obtained an exclusive privilege or

---

* Here we have instances of the injustice and grasping cupidity of the Patent Office, which at one time, for the sake of the fees, would grant a patent upon the slightest pretext of improvement, leaving the real inventor to involve himself in law-suits for the exclusive benefit of the law courts. Patents should be done away with entirely, the State rewarding *real* invention and improvements, according to merit, from the Consolidated Fund, and issuing them, after proof of their utility, under annual license to the public.

brevet for supplying the French Navy, little or nothing was made of it, they, however, manufactured largely for the merchant service. One of the first merchant ships fitted with Brown's patent cable, after the 'Penelopé,' was the 'Perseverance,' belonging to Messrs. Inglis, Ellice and Co. in 1813. She was commanded by Captain Livingstone."

Iron mooring chains have been used for securing our ships of war in Portsmouth and Devonport harbours, and in the Medway, &c., for a very long time; probably first really invented by Philip White, the blacksmith, in the early part of the seventeenth century, according to his quaint description before named, and for which he obtained a patent some two hundred and thirty years ago! *Chains* themselves were known to have been manufactured from the earliest recorded period of time. Tubal Cain, as stated in the Book of Genesis, was the first worker in iron; and there are no less than twenty-seven passages in the Sacred Volume where "chains" are mentioned, either of iron, brass, silver, or gold. Chains of iron or brass [? bronze] were formerly used for mooring the Roman, Carthagenian, Venetian, and Turkish galleys, &c., in port, and probably by the Phœnicians long before; also for securing the narrow entrances of harbours from surprise by ships of the enemy (the large iron rings for this purpose fastened into the rocks upon each side of the entrance to Dartmouth harbour are still extant.) Chains were also employed for strengthening booms across rivers in times of siege; rebellious cities were in olden times punished by taking away their barrier chains. Iron chains were also attached to grappling anchors and fastened to the yard arms of fire-ships, said by Livy to have been used by the Rhodians 190 B.C.; although it is generally thought that the first fire-ships fitted with grappling hooks and chains were successfully tried by the British against the enemy in the Skeldt off Antwerp, and afterwards used against the Spanish Armada in 1588, when the Spanish ships were at anchor off Calais, which was carried into effect by Sir Howard of Effingham, the Commander-in-Chief of the British fleet, also with great success. The chains of the grappling irons were stopped along the yards of the fire-ships and secured round the lower mast heads.* Chains were also used for slinging the

---

* Fire-ships were successfully used by the Greeks against the Turkish fleet during the revolutionary and sanguinary war which broke out in 1818; and in the year 1821 a large Turkish line of battle ship was destroyed, with all her crew of 800 men, by Greek fire-ships in the gulf of Adramitium. On the 1st January, 1822, the Provisional Government of Greece issued their declaration of Independence, and it was during this year that the most notable and daring attack by a fire-ship and its terrible consequences took place off Chesmé in the straits of Scio. As the author was at Smyrna with his father when it occurred, and had the honour of knowing personally the brave Canaris who proposed and carried out this wonderful enterprise, receiving the thrilling narrative of its execution from his own lips at Ægina, when Master of H.M. Steamship 'Medea' in December, 1835, it may not be out of place here to give an account of this dashing, but alas! cruel affair.

In the spring of 1822 the Turkish Government having been informed that the wealthy Greek inhabitants of the island of Scio (the ancient Chios) had furnished the revolutionary government with funds to carry on the war, and were showing symptoms of disaffection, it was resolved to make a terrible example; and on the 23rd of April of that year, a Turkish fleet of fifty sail, including five or six line of battle ships and ten frigates, under the Capitan Pacha Kara Ali, anchored off the flourishing, beautiful town of Scio, and commenced bombarding it. They then landed the troops, and having put all the inhabitants to the sword—including even the patriarchs—without mercy or distinction of age or sex, next plundered the town and villages of all the treasure and valuables they could find, and then set fire to the houses, churches, and convents—cut down all the olive trees, the orange, fig and other fruit trees, and laid everything waste and desolate with fire and sword throughout the island, destroying man, woman, and child—babe and suckling! Some 45 to 50,000 persons are said to have fallen a sacrifice on this occasion, all perishing except about 3,500 to 4,000 of the most beautiful daughters of the inhabitants, who were reserved from death for sale in the bazaars. Several of the inhabitants however managed to escape from the back of the island huge cross-jack yard of olden times, and the main and fore yards—before going into action: these were

in boats to the island of Ipsara, and gave information of the dreadful carnage; whereupon Admiral Miaoulis, who was there at the time, dispatched the brave Canaris with two fire-ships to try and cut off the Turkish flagship and her consort, the rest of the Turkish fleet having put to sea for Candia. An Austrian barque had been purchased by the Ipsariots to be converted into a ship of war, and was lying in the harbour, also a brig belonging to Hydra. Not a moment was lost, the sails and rigging were smeared with raw turpentine, the hold of each ship, above the ballast, filled with brushwood, well saturated with raw turpentine, tar, pitch, and sulphur, and as many tar barrels and bags of sulphur as could be procured were stowed with the prepared fascines in the hold; the decks, bulwarks, &c., were also well smeared with the same combustible materials, and early in the morning of the 9th June, 1822, Canaris set out from the port of Ipsara with his two ships, full of hope—and thirsting for revenge. He had only twelve men with him, and placed the same number under a trusty officer on board the Hydriot brig. Canaris issued his instructions to his consort not to make any attack until the evening, and to proceed at a distance from each other with the Austrian flag flying, and their long boats or launches towing astern to appear like ordinary Levant trading vessels; that *he* intended tackling the Capitan Pasha himself, and the Hydriot was to lay the other on board and to act by stratagem in concert at sunset. On rounding the south end of Scio, Canaris observed the monster ship of the Capitan Pasha, standing across under easy canvas from Scio towards Chesmé roads on the Asiatic shore, where she shortly anchored and furled sails; the other line of battle ship was still lying at anchor in the roads of Scio, with a transport in shore of her; for the Turkish Admiral having heard that Tombasi, the Greek Commander-in-Chief, had followed the Turkish fleet to Candia with all his fire ships, &c., had not the slightest idea of being molested, but had embarked most of the treasure and valuables, together with some 1,500 Greek girls, all the church plate, &c., on board his own ship, leaving the other ship and a transport to embark the remainder with the straggling troops not required to garrison the island; intending to return in triumph to Stamboul, after wooding and watering at Chesmé—but it was ordered otherwise. The wind was blowing fresh from the north, right through the straits of Scio, as the bold Canaris stood across from shore to shore, beating to windward like an ordinary merchant ship. Just before sunset he fetched on the port tack within a quarter of a mile of the Capitan Pasha's three decker, as she lay moored with the blood red flag surmounted with the crescent and star, proudly flying at the main royal mast head. On the next tack he passed within hail and dipped the ensign, which was courteously acknowledged (not the called "top chains." Chain boarding nettings were also formerly used to prevent being boarded by the

Greek ensign be it observed). On being hailed from the Turk, in *lingua franca*, Canaris, respectably dressed like the captain of an Austrian merchant ship, his crew in the clothing of Austrian sailors, replied that he was from Trieste, bound to Smyrna, so that not the slightest suspicion was aroused on the part of the Turk, whose boats were all hoisted up, the anchor watch set, most of the crew asleep, fatigued with the results of slaughter and pillage, and the band was playing with a view to soothe the unfortunate captives, groups of whom the Greeks beheld recumbent on the quarter deck absorbed in grief. This pitiable sight was enough to soften in one sense, the heart of many men, and deter them from their dire purpose; but Canaris was resolved to do or die in the attempt, and reconciled to his conscience that the poor, unfortunate captive girls must inevitably suffer in the general Holocaust of stern revenge he was about to consummate!

It was getting dusk, the sun had gone down over Scio with a fiery hue, through the lurid atmosphere still hanging over the smouldering ruins of the devoted town. The dreadful time for action was approaching. Canaris again tacked and stood as though intending to cross the ships' bows, carrying courses, jib single reefed topsails, and topgallant sails. The awful moment was at hand. Everything was prepared, the trains laid, lanterns and torches ready. As he approached towards the bows of the ship he was again hailed, and politely requested by the officer of the watch to go about as he did not think he would be able to weather. The helm was put down apparently with this object, but the barque intentionally missed stays, and by a masterly manœuvre of the yards and helm as the sails again filled, she forged ahead and cleverly dropped right across the hawse of the monster ship, whose jib-boom now lay between the foremast and mainmast heads, with her port cathead through the unbrailed mizen of the fire-ship. The terrible moment had arrived; the launch was hauled up on the weather quarter; the trains simultaneously fired: and in an instant the barque was a mass of crackling flames almost from end to end, and from the deck to the foremast and mainmast heads; the blazing sails and rigging with sulphurous fumes pouring down upon the Turk like a volcanic avalanche! In vain was the fire bell rung, and the boarders called away—all was panic and confusion. At the same moment Canaris, having ordered his men into the launch, ran aft—like an apparition in the midst of the burning flames—hauled down the Austrian ensign from the peak, hoisted at the mizen topmast head the Greek flag of independence, which had been saturated with salt and water, together with the halliards and rigging of the mizen mast in order to prevent their being too quickly consumed, belayed the halliards to the weather quarter iron, the work of a moment, and enemy from boats. In large wooden ships chain links are still used for attaching the dead eyes of the

leapt into the launch with a loud "ZETO HELLAS" (Ζητο ʽΕλλας) which was echoed again and again by his gallant crew as they manned the oars and pulled sturdily dead to windward.

The Turks were so completely stupified, paralysed, and awe-stricken, that, although the retreating launch could be plainly seen through the hissing blue sheets of flame which now enveloped the whole of the forecastle, where not a man could remain, not a musket was levelled at the daring Greeks. Guns only were fired as signals of distress; but every man was bent on trying to save himself and his plunder by rushing to the boats, which, one after the other, were swamped alongside, either in lowering one end first, as usual in cases of panic, or by the frightened Turks crowding into them. All discipline was at an end, for the roaring flames, bursting from the hull and rigging of the fire-ship fanned by the strong wind, had taken complete hold of the fore part of the Turk. In a few minutes the blood-stained lion rampant figure of the head was consumed, together with the head-sails, and spars, &c.; and the sulphurous charged flames were now rushing along the 'tween decks to the after part of the ship. The masts and rigging were soon in a blaze, so that by the time the hempen cables had burnt through, the whole ship, fore and aft, was a burning fiery furnace; and as she drifted broadside to the wind, after the parting of the cables, the loaded guns from all her three decks went off one after the other like the sad, melancholy, multiplied boomings of "the minute gun at sea," mingled with the shouts and screams of the suffocating crew and doomed captives. Canaris being quickly beyond the reach of pursuit, lay on his oars, and with subdued emotion watched the burning ship with a satisfaction not unalloyed with manly grief. The embers of the burnt houses at Scio, not yet quenched, lit up one side of the strait, whilst the towering, blazing three decker illumined the Asiatic shore on the other. The stern nature of the rude islanders for the moment gave way, at beholding this terrible work of their hands—this dreadful vision of reality! They remained wrapt in silent, thoughtful reverie, and alternately wept with mingled feelings of joy and sorrow, breathing a prayer of thanksgiving to heaven—a solemn vesper prayer! The charred remains of their well sacrificed ship, without the aid of grapplings, still held with a deadly grasp, in terrible embrace, their monster foe, although now reduced to a mere shell at the water's edge; but strange to say they beheld the flag of Greece still fluttering aloft at the yet unconsumed mizen topmast head, when suddenly the mast fell, and they saw, or thought they saw, their beloved emblem of freedom borne aloft by the breeze like a meteor in the sky, vanishing above the burning Turkish flag. At that moment a loud explosion rent the air and roused them from their reverie, which still seemed but lower rigging to the ship's sides, over extended horizontal platforms called chain wales or "channels,"

a dream. The fire had reached the magazine, and the burning mass of wreck, and masts, and yards, with the remains of the dead and dying rose quivering in the midst of the awful vision—and all was over!—

> "Then rose from sea to sky the wild farewell—
>   Then shriek'd the timid and stood still the brave,—
> Then some leap'd overboard with dreadful yell,
>   As eager to anticipate their grave;
> And the sea yawn'd around her like a hell,
>   And down she suck'd with her the whirling wave,
> Like one who grapples with his enemy,
> And strives to strangle him before he die!
>
> And first one univeral shriek there rush'd,
>   Louder than the loud ocean, like a crash
> Of echoing thunder; and then all was hush'd,
>   Save the wild wind and the remorseless dash
> Of billows; but at intervals there gushed,
>   Accompanied with a convulsive splash,
> A solitary shriek, the bubbling cry
> Of some strong swimmer in his agony!"

It was thought that at least 1,400 Turkish sailors and troops perished on this occasion, not 100 escaped altogether, and all the poor captives, sad to relate, without exception, passed into eternity! And now the victors, observing a fire looming on the Scio side of the strait, Canaris and his faithful band hoisted their sail and proceeded towards the spot where the other line of battle ship was expected to have shared the fate of the Capitan Pasha; but the consort of Kanaris had not managed matters with such skill as his chief. The Hydriot Commander (whose name is not recorded) in beating to windward, passed far ahead of his intended victim, flying the Imperial flag unsuspected; but by this time the glare and report of guns from the distant burning three decker aroused the Turk to a sense of danger, and as the Hydriot, with chained grapplings at the yard arms, was *fired up* ahead of the ship and put before the wind to rush down upon the foe, and the Hydriots had taken to their boat—the cables of the Turkish ship were cut, and she ran out to sea unmolested, allowing the fire-ship to burn away in peace, to the great chagrin of the Hydriot Commander and his crew. They, however, were determined to try and take possession of the transport, and gallantly pulled in shore towards her, intending to carry her by boarding; but a strong chain netting had been secured along the sides of this transport, which they found it impossible to penetrate or sever, and the crew of the Turk now poured a deadly fire of musketry upon the for giving more spread to the rigging, and these platforms hence became themselves to be called the fore,

Hydriotes, killing and wounding several of their number, including the Commander; and all would probably have shared the same fate, notwithstanding their noble attack and defence with musketry, pistols, and cutlasses, had not the gallant Canaris, seeing the flashing of the small arms, and judging the cause, arrived in his launch to the rescue at the very nick of time. The Hydriot launch had dropped towards the stern keeping up a fire on the crowded decks of the transport, but, alas! their last cartridge was expended. At that moment the launch of the gallant Canaris fell across the bows; and leading the way, he and his brave followers, with loud ZETOES, mounted the spritsail yard, and climbing over the boarding netting from the bowsprit, were soon in possession of the upper deck without losing a man. The iron netting on the quarter was cut adrift to admit the remnant of the Hydriotes, and the surprised and frightened Turks were all slain and thrown overboard. The anchors were then weighed, and before daylight the prize, loaded with plunder from the murdered Sciots, was underweigh with the two launches in tow. About 50 young Greek girls were found below and saved from death. The gallant, daring band arrived at Ipsara by noon of the following day, and, as may be supposed, were warmly received by their admiring countrymen. The glorious news was soon conveyed to the Provisional Government in the Morea, and the brave Canaris, deservedly promoted to the rank of Admiral, received also the thanks of the Government.

As a sequel to this gallant although horrible affair, as soon as the Governor of Smyrna received the news of the Chesmé catastrophe he immediately issued an order to massacre all the poor unoffending Greeks in Smyrna—man, woman, and child, without mercy. The ship in which the author of this treatise then was, lay moored close to the town, and the frightful, sickening scenes that took place, plainly visible from her decks, will never be effaced from his memory. The screams and groans of the innocent Greeks, as they were being slaughtered by the brutal Turkish soldiery, during one whole night, were truly dreadful and heartrending. Many of the poor, frightened, and wounded creatures, who survived that fearful night, sought refuge on board the English, Austrian, and Italian merchant ships on the following morning. The Turks, however, kept up a fire upon them in their retreat, and the balls which missed the boats fell on board the ships, which had to weigh their anchors and go into the outer roads, whilst H.M.S. 'Hind,' lying off Smyrna, for the protection of British interests, took up the position the author's ship had left. The Commander of the 'Hind' then sent a despatch to the Governor, begging mercy for the remaining Greeks, through the British Consul, and stating that if any more balls were fired on British ships he would bombard the town. This main, and mizen *chains.* The arms of the old kingdom of Navarre were golden chains, one of their kings having in a battle with the Moors, whilst assisting Spain to recover her possessions in the early part of the thirteenth century, "forced the chains of the Moorish stronghold."

The chiefs of the ancient Gauls wore a golden chain to distinguish them from the common soldiers, and hence probably the origin of this badge of office appertaining to mayors. King Richard I. is said to have created the first Mayor of London either in the year 1189 or '91, who held the office for life, the titles previously having been Portreve and Bailiff, and the golden chain might have been a badge of civic honor at that time, or made so by King John, who in 1214 instituted annual mayoralties—although it is not certainly known whether Sir William Walworth was or was not the first *Lord* Mayor as well as the first

had the desired effect, for by noon of that day the firing had pretty well ceased, the Turks being satiated with slaughter. It did not transpire how many poor innocent creatures were butchered in Smyrna on this occasion, and it probably never will be correctly known. It was supposed to amount to several thousands, whilst their property was all confiscated and sold. Early in 1824, Ipsara and more than half its brave inhabitants shared the same fate as Scio! Such are a few of the atrocities connected with the Greek war of Independence, which were, however, multiplied some ten fold in Candia and the Morea, under Ibraham Pasha, in 1825, '26, and '27, previously to the battle of Navarino, when the Turko-Egyptian fleet was utterly destroyed by the combined fleet under Admiral, Sir E. Codrington. Scio at the time of this massacre contained about 100,000 inhabitants; it had besides the beautiful town of Scio itself, sixty-eight villages, in which were 300 convents and 700 churches; and the island was highly cultivated throughout, interspersed with handsome villas and delightful parks and gardens. Canaris, who was called *The Brulotier*, is said to have himself destroyed no less than five Turkish ships of war altogether with some 3,000 Turks. One Turkish line of battle ship, burnt off, the island of Tenedos, had 1,000 on board, all of whom perished! He was a little man, with a slightly turned up nose, and of a wiry, determined appearance, the dread of the Turks, and Idol of his countrymen.

Chief Magistrate invested with the gold chain, when the quartered dagger was given by King Richard II. to the armorial bearings of the city of London—after the spirited conduct of his Worship in felling Wat Tyler with the mace at Smithfield in 1381, or, as some historians state, plunging a dagger into his throat nearly two centuries after the first Mayor of London was created. The etymology of the title "Lord" is rather obscure, but it is generally understood in a lay sense to signify "*a giver of bread.*" From the Saxon words *illaf*, a loaf of bread, and *ford*, to give or afford, abbreviated to *Laford.* Lady is said by the same authority (J. Coates) to be derived from *Illafday*, as the wealthy and high born dames used to distribute alms of bread on certain days to the poor. It was customary in the ancient Saxon to drop the *f*, thus *Illaford* became abbreviated into Laford, and by dropping the *f* making it Laord, and *Illafday* in the same way became Lady. In the mediæval or dark ages, good and pious men were chained to the stake and burnt alive for the honor and glory of God, by cruel zealots of the Church of Rome, and malefactors have from time immemorial been hung in chains.

Galley slaves were formerly *chained* to the benches from whence they worked the oars before steam engines, paddles, and screws were invented. Prisoners were and are still in some countries *chained* to the walls of their cells; and it is said by some historians that the celebrated Eremite, Simon Stylites, in the fifth century, lived for thirty-seven years on the top of five different pillars in succession, with a *chain* round his left leg, or some say his neck, and all for the honor and glory of God! beginning with the first only nine feet high, then eighteen, then thirty-three, then fifty-four, and, lastly, after this progressive promotion or spiritual advancement, sixty feet high!

which was no doubt in those days considered the quintessential point of elevation and devotion for a good preacher. Query, was this "*look-out-man*" the origin of the word *anchorite?* St. Simon used, it is said, to lower down a basket with a line at matins and vespers for bread and water with an occasional cold ckicken, an onion, and a gourd of wine, after exhorting his admiring congregation to charity and good works. The top of this column was, it seems, only three feet in diameter, or square, if it had a capital, so that the poor, foolish, old hermit could not have been very comfortable at any time, and it must have been miserable in cold, wet weather with no sou-wester and oilskins! May not this "Simon Pure" have originated the Christmas game, handed down to the present day by oral tradition, where our boys and girls join hands in a circle and dance round singing—

"Here a health to Saint Simon the king,[*]
A health to Saint Simon the squire,[†]
And a health to each bonny young lass in the ring,
Dancing around the fire.[‡]

Lift your left leg up—stretch your right leg out—
Shake it a little—a little—a little, and turn yourself about."[§]

The old Greek sailors have a toast which translated into English means, "long may you live to shake a leg"—also "may your shadow never be less"—they also used to swear by "the man at the masthead." Query, did this custom originate the mastheading of midshipmen? or perhaps the Trafalgar Pillar? although Nelson has a hempen *cable* at his feet, *chain cables* not having come into use until after Trafalgar. But even supposing that the ships in those days had had *chain* cables—this emblem of strength and security—in our National Metal—would not have been admitted as an appendage, inasmuch as the author was told by the late Sir Charles Eastlake that any device in *iron*, let it be ever so beautiful, even the most elaborate designs of fruit, flowers, carved work, &c.—the choicest patterns from the Colebrook Dale Works—could not for a moment be allowed by the rules of the Royal Academy in any monument, as works in *iron* were *unclassical:* the design must be of bronze, marble, or stone. This answer was elicited from Sir Charles by the author in 1862 when he presented, under the signature of DELTA, to the Committee, a design for an Albert memorial obelisk of galvanized *iron*, which was thought very highly of as an elaborate, historical, and chronological work of art; but, notwithstanding that this is the *age of iron*, "it was not *classical*," and could not be admitted. Her Majesty the Queen was graciously pleased to accept a copy of the drawings of this design, which were much admired. The author, when last at Athens, observed the remains of a roofed stone hut about the size of a dog kennel (certainly an improvement on the old style) perched on the top of one of the columns of the finest ruin in Greece, that of Jupiter Olympius. It is said to have been occupied by an old Greek hermit as late as the close of the last century, although the Christian sect of Pillarites was generally done away with in the twelfth century. This one, no doubt, took a hint from the magpie. It is thought that the Mahometan minarets, from the top of which the Moslem priest, or sacred crier, calls the Faithful to prayers, were suggested to Mahomet by these devotional pillars of the Christian Eremites. It is also said that the Fakirs in Persia and Arabia still follow the custom of the "Stylites" up to the present day, and load their bodies with heavy *chains*. Query, were the uncapped round towers of Ireland and Scotland ever used for this purpose? or were *they* erected by the Arabian worshippers of Baael, who, as Palgrave tells us, made a fire on the top of their towers and danced round them in honor of the Pole star as Jah or Baael: this star always remaining in one position in the heavens—all the other stars revolving round it as a fixed Deity! Did they travel to the north-west to try and reach this pole star, and finding it constantly appearing higher and higher above their heads as they proceeded—after reaching the *ultima thule* of Scotland and Ireland—there erect their round towers, light their fires, and dance around them as in Arabia? Query, if so, is not the famous Baal-tein, or "Bel-t'ing Night," as it is called in Scotland, the remains of such original heathen rites? Baael or Bel or Belus being one of the names of Jehovah, Jah, Jove or Jupiter the supreme God of the Chaldeans, Assyrians, &c., and *ing* or *ingle* signifying fire.*

---

[*] *sic*—"King of the Castle."
[†] A moral *escudero*, no doubt.
[‡] An allusion to, or identification with, the Baael-t'ing dance.
[§] Evidently an exhortation to the old Pillarite to shew them that he was alive to their devotion.

---

* Ireland boasts of having been peopled by a colony from Greece, 322 years after the flood (?) headed by one Partholanus; but the colonists all died off, it appears, and another batch arrived from the *East*, headed by one Nemedius, who was supposed to be an Arabian, and probably introduced the round towers; or did the Belgæ introduce them when *they* came to Europe (probably also from Arabia) crossing over to Britain, and from thence invading Ireland 350 B.C.? Who were the Belgæ? Did they take their name from their God Baael, the north star, and come in search of it. Did they give their name to Bel-lac, Bel-ley, Belesine, &c., in France, to Bel-fast, and Old Baal's bridge, near Limerick, the ruins of which were pulled down some twenty-five years ago. Did they give their name to the various places in Ireland beginning with Bal or Bel, such as Bel-turbet, Bally-shannon, Bally-bunian, Balachonery, Bally-nahinch, Balli-sedare, Balli-na, Ballihac, Ballinasloe, Balbriggen, Ballinrobe, &c., &c.; then in Scotland we have Balmoral, Ballinar, Ballahulish, Ballachulish, &c.; and what are we to infer from the upright stones or pillars which still stand near Cargil in Scotland, carved with figures of the moon and stars, and the hieroglyphical column which still conspicuously stands, or did stand till lately, on the Moor of Rhyne in Aberdeenshire?

There is a tradition, which the author learnt when in Peru, from an intelligent Indian of Cuzco, that one of the Incas, the immediate descendant of the sacred MANCO CAPAC and MAMA OCOLLO, caused a chain of gold to be made of enormous size and weight which was kept in the temple of the Sun either at Puno or Cuzco, and borne in procession on the shoulders of one hundred men on State occasions during the Sovereignty of the Incas; and that after

What are the round towers still extant in the Orkneys and extreme northern parts of Scotland? To what period can we ascribe the monumental pillar that existed at Ruthwell in Dumfrieshire, in the seventeenth century. It was about twenty-five feet high, including the pedestal; on the four sides of which were hieroglyphics, such as birds, foliage, and marine animals, besides letters supposed to be Runic: it was held in such high veneration by the people, that a decree of the General Assembly of the Kirk, in 1644, ordered it be destroyed as an object of idolatry. The festival of Bel-t'ing is still held in Scotland, and in the northern parts of Ireland, on the evening of the 1st May, and also on the 21st June in Ireland, and even in England it is customary on the evening of May-day to light fires on the hills. "Bel-tein or *ing* signifies the fire of Baael, the worship of which deity formerly existed in England, Ireland, and Scotland; *La na Baael tina* and *nina Baael tina* are the day and eve of Baael's fire, in the Irish language. This pagan ceremony of lighting these fires in honor of Belus (or Jah) gave its name to the entire month of May, which is to this day called *Mina* Baael *tine* or t'ing. (O'Bryan's Dictionary, 4th edition, 1768). Sir John Sinclair says, in his statistics of Scotland—"On the 1st May, which is called Baael-t'ing day, all the boys meet on the moors, they cut a sod and make a round trench that will hold the whole company, they then kindle a fire in the middle and dress a custard of eggs and milk, they then knead a cake of oatmeal and toast it at the embers. After eating the custard, they divide the cake into as many pieces as the company consists of in number: one piece is blackened with charcoal, and all are put into a bonnet; whoever draws the black bit is the one to be sacrificed to Baael, which in the present day innocently consists in his being compelled to leap three times through the flames, round which the company dance.† On the 21st of June fires are made on the tops of the hills, and every member of the family is made to jump through the flames. The custom is also, or was till lately, observed in Lancashire, also in Ayrshire, and even in Sweden." This idolatrous ceremony is frequently mentioned in the Bible as being practiced by the followers of Baael.

† Query, is this dance the origin of the *Pyrrhic* dance?

the shameful, treacherous conduct of Pizzaro,* the priests of the temple fearing that their gold chain would be taken from them by this merciless robber and his followers, had it thrown into the lake Tichicaca, where the author was informed it had been frequently swept for, but up to the present day without success. The early ships of the Mediterranean, according to Grotius, Bochart, and Elsner had double rudders suspended and attached to the ship's stern by *chains*. Xerxes is said to have chained or fettered the Hellespont, and flogged it in consequence of his bridge of boats having been twice destroyed by rough weather some 2,354 years ago. Now we cannot suppose for a moment that this wonderful Persian monarch who, as recorded by Herodotus, led such an enormous army into Greece, and had some thousands of vessels at his command, could have been such an idiot as he has been here represented: it is therefore probable that as all Oriental history was written more or

---

* Pizzaro first caused his captive Atahualpa to be kept in close confinement until ransomed by an enormous amount of gold, which he no sooner received, than at the instigation of that bigotted and infamous scoundrel-priest, Valverde, he ordered the poor, innocent Inca to be cruelly murdered. He was condemned to be burnt alive as a heretic, but by a blasphemous mockery of religion was promised that if he would be baptised and embrace the Christian faith he should merely be strangled at the stake, and then he would be admitted into the joys of heaven. It is said—although in the same sense attributed to Hatuey, a Cazique of Hispaniola, when taken in arms against the Spaniards at the eastern part of Cuba, and condemned to be burnt alive—that Atahualpa enquired, after having been baptized, where the baptized Spaniards went to after death, and was told to Heaven, when he emphatically replied, "then I would rather go to Hell! to avoid the company of your accursed race." It is to be hoped that a retributive Providence reversed this ideal wish to poor Atahualpa's future bliss in "another and a better world!" Within the last fifty-three years the Inquisition, or "Holy Office" as it was called *par excellénce*, was in full swing in Spain. The prisoners who differed in opinion as to the Roman Catholic faith were, after imprisonment and mock trial by the inquisitors, handed over to the secular arm and thrown into the common prison, then loaded with *chains* and brought before the civil judge, who, after asking in what religion they intended to die, pronounced sentence accordingly; and these scoundrels (playing into the hands of the villainous Church party) allowed those heretics, who wished to be baptised in the Roman faith, the *privilege* of being merely strangled at the stake, and *then* burnt to ashes; whilst those who persisted in differing from the Church of Rome, although firm believers in Almighty God and his Son Jesus Christ as the Saviour and Redeemer of mankind, now called Protestants, were ordered to be burnt alive, for the honor and glory of God! They were then marched to the place of execution and the negative and relapse being first strangled and then burnt, the others were bound with chains to the iron grating, above the stake, and their beards and hair, chins, lips, noses, ears and eyebrows singed and burnt off with torches or blazing furze bushes; this was called "*making the dogs' beards*," the fires were then kindled below their feet, and the poor wretches literally roasted alive! These diabolical acts were beheld with satisfaction and superstitious joy by the villainous priests and emissaries of the Roman Pontiff and also by the bigotted priest-ridden multitude, who were taught to believe that such barbarous cruelty was "doing God service!"† There are no doubt

† A fulfilment of our Saviour's word as set forth in the 2nd verse of the xvi. chap. of St. John's Gospel.

many Roman Catholics now existing who would gladly see this dreadful Inquisition, with all its horrors, re-established even in England and Ireland—should Popery ever again get into power—which God forbid! For what would become of us poor Protestants, Nonconformists, Wesleyans, &c., it is frightful to contemplate! Even those *sham* Roman Catholics, the Ritualists of the Purchas and Machonochie school, would stand but a poor chance, and probably be amongst the first for strangulation at the stake or roasting alive! The cruel, savage rites of the Druids, in the days of the ancient Britons, who filled wickerwork idols with living human beings, and then set fire to them; or the priests of Cronus or Moloch, who invented the red hot brazen idol, and roasted their victims alive in honour of Jehovah, had more excuse for their ignorant cruelties than those self-righteous scoundrels of the Church of Rome, who tortured and treacherously murdered their victims because they differed in opinion with them as to the mode of worshipping the Redeemer! in order to support "the congregation of the *Propoganda fidei*" for the sale of indulgences, dispensations, &c.—which is still rampant in our midst! Pio Nono is said to be "a *link* of St. Peter's *Chain*," yet the papers tell us that this "*infallible* representative of Our Saviour on earth lately refused to wash the feet of the '*poor beggars*' of students, owing to having lost his *temporal* power, and that when his *emaculate* Deputy Franchi touched their naked toes with a sponge they grinned from ear to ear!"—*Spongia mirabilis!!!*

less in a figurative sense, and as he had no doubt a vast number of engineers from Egypt, and workers in bronze and iron from Phœnicia amongst his followers, he may have caused a chain to be forged that would reach across the narrowest part of the Hellespont, the breadth of which the author ascertained from Mr. Calvert, H.B. Majesty's Consul for the Dardanelles, when he last visited the castles there, was but little over half a mile. Captain Spratt, R.N., the celebrated surveyor, in 1855, made the exact distance from the beach at the mouth of the Rhodius river at Chanac-Kaleh-si to the beach at Namazied, 662 fathoms. Now this scarcely exceeds three-fourths more chain-cable than each sailing ship of 3,000 tons is compelled to carry according to Lloyd's rules in the present day,* and this chain supposing it to have been 700 fathoms in length, to allow for curvature and shore fastenings, could have been well supported across the bows of as many vessels as might be required to form the bridge, trussed by diagonal chains from the central portion to inshore anchors or the shore itself. It is said by Sir Walter Raleigh, in his *History of the World*, that Xerxes used 672 galleys to form his bridge, if so, there must have been two if not three tiers of vessels. The depth in the centre of the strait at this point is fifty fathoms, shoaling to fourteen and thirteen fathoms inshore on either side; and supposing this trans-pontine chain to have been so made, and thus used, which seems very feasible, it may be *figuratively* expressed that Xerxes both chained or fettered the Hellespont, and, as our American cousins would say, "whipped" or flogged it into subjection! It is not improbable also that many of his followers were Lemniotes, who were famed for their skill in the working of iron. Vulcan himself, so mythological history tells us, first established his head-quarters in the island of Lemnos, after being kicked out of Heaven by Jupiter;[*] and Herodotus informs us that one Glaucus, a native of Chios, invented the art of inlaying iron. He also states that "the Phocæians were the first of the Hellenes who undertook long voyages in vessels they built called Ponteconters or fifty oared galleys;" and, according to the same authority, as a proof that these people knew something about the manufacture of iron, perhaps even to puddling it, on their return to Phocæa, "after destroying the garrison which the Persians had left to guard the city, they sunk a mass of red hot iron into the sea, left their native city again, and swore not to return until the iron should re-appear." The object of this resolve does *not* appear, unless we may consider it to be the type of iron ships! but a number of these famous Sailors, who had founded Marseilles (as Massillia), colonised Corsica, and visited Tarcessus or Tarshish, beyond the pillars of Hercules, we are told "were seized with regret, and violating their oaths, sailed back to Phocæa;" but whether they recovered the mass of iron or not, or whether it was pig, sheet or bar iron, and remained at the bottom or floated on the return of the renegades in the form of iron galleys, we are left to our own conjectures to imagine.[†]

---

* See pages 36, 37.

When the author last visited Phocæa, now called Fokia, and in some old charts Fouges and Foges, now a small, miserable Turkish town on the left-hand or north side of the entrance to the gulf of Smyrna, with two snug harbours—and bearing in mind the strange story told by Herodotus about "*the mass of red hot iron*" he could not help letting the imagination run a little riot:—Could these interesting, enterprising Lydians really have understood the working of iron in such a manner as to build *iron* boats? Did *they* know how to make chain-cables? For as Solomon tells us:—

---

[*] The poet tells us that Vulcan also had an establishment in Sicily where he worked for his old master, viz:—

"When Vulcan forged the bolts of Jove,
In Etna's roaring glow,
Neptune petitioned he might prove
Their use and power below.

But finding in the boundless deep,
Such terrors did but idly sleep;
He with them armed Britannia's hand,
To guard from foes her native land."—*Sea Song.*

[†] Query—Were these Phocæans the *original* "Old Fogies?"—from "*Phoca,*" a sea-lion, sea-dog, sea-calf or seal; as "Old Tar"

"The thing that *hath* been, it is that which *shall* be; and that which *is* done, is that which *shall* be done: and there is *no new thing* under the sun!

"Is there *anything* whereof it may be said, see, this is new? it *hath* been already of old time which was before us."—*Ecclesiastes* i., 9, 10.

What would these *original* old Fogies say, could they now rise from their ashes, to behold the huge British *Iron*-clads, with *iron* hulls, *iron* guns, *iron* masts, *iron* decks, *iron* rigging, and *iron* cables, lying in their neighbouring port of Clazomené—now degenerated into "Vourla Bay!"

Sir Walter Raleigh, in his *Discourse on the First Invention of Ships*, written towards the close of the sixteenth century, and published by Philip Raleigh, Esq., his only grandson, in 1702, says:—"In Cæsar's time (above 1,900 years ago) the French-Britons, who were then esteemed the best seamen, had untoward tubs in which they made war against him, for they took the wind in sails of leather, heavy and unplyable; and they fastened their ships to the ground, and rid at anchor with *cables of iron chains*, having neither canvas nor cordage, insomuch as the best of

---

may have been derived, not from the tar-bucket as some have supposed, but from old hands who had commanded or served in the "Ships of Tarshish," which was once the Liverpool of Iberia, and gave its name to all large ships trading to it, or to Cornwall and Devonshire by the Phœnicians for tin and lead.

them which were of *Vannes*,* are described with high heads, raised up deformedly above the rest of the building; to which kind of form, that they were constrained, the reason is manifest; for had their *cables of iron chains* held any great length, they had been unportable; and being short, the ships must have sunk at an anchor in any storm of weather or counter-tide. And such was their simplicity in those days, as, instead of accommodating their furniture to their ships, they formed their ships to their furniture." Further on in this curious work he says: "Whosoever were the inventors we find that every age hath added somewhat to ships, and to all things else; and, in mine own time (1590), the shape of our English ships hath been greatly bettered. It is not long since the striking of the topmast (a wonderful ease to great ships both at sea and in harbour) hath been devised, together with the *chain* pump, which takes up twice as much water as the ordinary did. We have lately added the *bonnet* and the *drabler* to the courses; we have devised studding sails, topgallant sails, spritsails, and spritsail topsails. The weighing of anchors by the "*capstone*" is also new—we have fallen into consideration of the length of *cables*, and by it we resist the malice of the greatest winds that can blow: witness our small millbrooke men of Cornwal that ride it out at anchor half seas over, between England and Ireland, all the winter quarter: and witness the Hollanders that were wont to ride before Dunkirk, with the wind at N.W., making a lee shoar

---

* This was the principal port of the *Veneti*, whose country was called Bretagne, and who fought so valiantly against Cæsar. This part of Gaul either *received* its name from the ancient Britons or *gave* it to our ancestors; and if Sir Walter Raleigh's data is correct, they may claim to having actually invented *Chain-cables* for ships some 2,000 years ago! No doubt they knew how to forge iron, as "they armed their chariots with huge scythes, and loaded the Roman Envoy or spy, Comius, with *chains*." Query, did they learn the art of working iron and bronze from the Phœnicians?

[illegible]
[illegible]
[illegible]—and
told by Herodotus a
he could not help
[illegible] Could these
really have under
manner as to buil
to make chain-cal

"The thing th
be; and that wh
done: and there

"Is there an
be new? it hath
before us."—E

What would
now saw from
iron clads, w
iron docks, i
their mighty
[illegible]

mand almost of the King of Spain, poor Raleigh was condemned, and beheaded on the 29th October, 1618, in the 68th year of his age—a sacrifice to the resentment of a mean, conceited, cowardly Prince!" The room in which this noble *Martyr* was born is still in existence, and is worthy of a pilgrimage, perhaps more so than to the shrines of many reputed Saints for which people travel thousands of miles! The house is called "Hayes' Barton." It is exactly opposite Starcross, on the other side of the Exe, about three miles distant from the author's house as the crow flies: the nearest village to the spot still bears the name of Withycombe Raleigh.

But it is time to slip the *chains* of ancient history and proceed to give a description of the Modern *Chain-cable,* and what the author conceives to be the advantages of an improvement recently patented by himself, to prevent loss of life and property owing to the fearful breakages of cables, which have taken place on board ship during the last few years, chiefly by the nip in the hawse pipe or across the sharp stems of iron ships (see Plates 1, 2, and 3.)

By "*The Shipping and Mercantile Gazette*" it appears that from the 5th November, 1872, to 5th February, 1873, no less than 263 chain-cables are known to have *parted* on board merchant ships in different parts of the world; and it is admitted that at least some thirty-seven more, not reported, may be safely added to this list, making in round numbers 300 breakages in three months! and for the balance of the month of February (twenty-three days) there were 32 more cables parted as per reports in "The Shipping and Mercantile Gazette" for that month.

The following table gives the names of the ships reported as having parted their cables for the three months alluded to, and the balance for February, with most of the places where the accidents happened, viz:

Tabular LIST OF SHIPS *which have* PARTED (*broken*) *their* CHAIN CABLES *for the Three Months ending 5th February, 1873, extracted from "The Shipping and Mercantile Gazette."*

N.B.—Some of these Ships are marked in the *Gazette* as having "*lost* their Anchors and Cables," which is entered as *parted*, taking no account of the great number of Ships reported as having *slipped* from their Anchors and Cables.

As the results of the *parting* (breaking) of Chain Cables and Ships *losing* their Anchors and Cables are only partially recorded in the public prints, some ships fouling others and causing great damage; some drifting helplessly on shore and becoming totally wrecked with their crews; some picked up by Tugs and towed into port; others only receiving partial damage by grounding and got afloat again, &c.—The reader is referred to *The Shipping and Mercantile Gazette*, *The Times*, *Daily News*, *Mitchell's Maritime Register*, *&c.*, for such particulars as are therein recorded under the dates specified in this list.

Date, 1872.	Name of Ship.	No. of Cables broken	Where happened.
Nov. 5	George S. Hunt	1	In the Downs
5	Terésita	1	at Scilly
6	Union	1	in Treport Roads
6	Louise	2	Lochindahi Bay
7	Agnes Edgwell	2	Barrow in Furness
7	Statesman	1	Albert Harbour
8	Marie Adele	1	Prince Edwards' Island
10	Antonio Padrovano	1	off Padstow
12	Concord	2	Yarmouth Roads
13	Catherine and Ann	1	Cuxhaven
13	Patience	1	Sundswall
13	Kathleen	2	off Hartlepool
13	Minister Thorbeck	2	Falsterboe
15	Peter and James	2	Heligoland
15	Queen Victoria	1	In the Humber
15	Mitchell	2	In the Downs
15	Enigheden	2	Off Nyborg
16	Thusnelde	2	Off Elsinore
22	Normand	1	Off Elsinore
22	Albert	2	Off Holyhead
22	Ubila	1	Not stated
22	Rossa Tachini	1	St. Mary's
23	Hope	2	Near Mouse Sand (Thames)
26	Augusta Clara	1	Spithead
26	Sagitta	2	Broad Sound
26	Pearl	1	Crookhaven
26	G. Paladin	1	Crookhaven
27	Taurus	1	Table Bay
	Carried forward ..	40	

Date, 1872.	Name of Ship.	No. of Cables broken	Where happened.
	Brought forward..	40	
Nov 28	Lavinia	1	Off Bic Island, river St. Lawrence
29	Aden	1	Caldy Roads, Bristol Channel
30	Magnet	2	Not stated
Dec. 6	Elizabeth Rose	2	Not stated
6	Flanders	2	Off Scroby Sand
7	Ocean Chief	1	Hondeklip Bay
8	Princess Beatrice	1	Spithead
8	Dorothea	2	Torbay
8	Margaret Ann	2	Swansea Roads
8	Arcana	2	Portland Roads
8	Friend's Endeavour	1	Portland Roads
8	Rival	2	Cardiff
8	Rowena	1	The Nore
8	Argentia	2	Cardiff
8	Azela	1	Great Yarmouth
8	Alice	1	Great Yarmouth
8	Daniel	2	Torbay
8	Fenna Hendrike	2	Torbay
8	Hannibal	1	Off Ramsgate
8	Isabella Granger	2	Yarmouth Roads
8	Marianna Secunda	2	Newport
8	Margaret Jones	1	St. Tudwell Roads
8	Rusco Castle	1	Yarmouth Roads
8	Saule	2	In the Severn
8	Superbo	2	Kingroad
8	Vigilant	1	Not stated
8	Budstikken	1	Cardiff Roads
8	Earl of Leicester	1	Yarmouth Roads
8	Charles Ball	2	Off Ramsgate
8	Hector	2	Mundsler
8	Louisa and Maria	1	Boston Deeps
8	Meteor	2	The Downs
8	Marian	2	Sand Bay
8	Squirrel	2	Lunday Roads
8	Satyr	1	Cardiff Roads
8	Grace de Dieu	2	Not stated
9	Una	2	Gunfleet Sand
9	Travancore	2	Walton Bay
9	Express	1	Off Ramsgate
9	Fleetwing	2	Yarmouth Roads
9	John Ernest	1	Off Ramsgate
9	Mersey	1	In the Mersey
	Carried forward..	105	

Date, 1872.	Name of Ship.	No. of Cables broken	Where happened.
	Brought forward..	105	
Dec. 9	Nora Lena	2	Wexford Bay
9	Pegasus	1	Off Ramsgate
9	Mena	1	Bremerhaven Roads
9	Matchless	1	Yarmouth Roads
9	Melpomone	2	Egremont, Mersey
9	Emilie et Fredina	2	Pill, Bristol Channel
10	Flandre	2	Yarmouth Roads
10	Royal Sovereign	1	In the Downs
10	Petit Corporal	2	St. Nazaire Roads
10	Safrar	2	Off Ramsgate
10	Hero	1	Dungeness
11	Nueva Nicolette	2	Pill, Bristol Channel
11	Courtenhay	2	In the Downs
14	Carl Johan	2	Off Ramsgate
14	Maria	1	In the Downs
15	Wangerland	1	Off Goodwin Sands
16	Ocean Queen	1	Off Shoeburyness
17	Endeavour	1	Off Douglas, Isle of Man
24	Weardale	2	Saffi Roads, Morocco
25	Artisan	1	Off Lewes
26	Ariel	1	Kingston Harbour
26	Bessie	1	Holyhead
27	Daniel Webster	1	Near Provincetown
27	Almoner	2	Gibraltar
30	Arturo	2	Penarth Roads, Bristol Channel
31	Vienne Fortunato	2	Black Sea
31	Duke of Cornwall	1	Dungeness
31	Grasshopper	2	Dungeness
Jan. 2	Stamatula	1	Not stated
1873 2	Tito	1	In the Downs
2	Queen of the West	1	In the Downs
3	Helvetia	1	In the Downs
4	Louisa	1	In the Downs
4	Gil	1	St. Michael's
11	Crested Wave	2	Mauritius
15	Amy	1	San Antonio
18	Concha	2	Teneriffe
18	Jean D'Acre	2	Portland Roads
18	Laiginglea	2	Cardiff Roads
18	Maria	1	Dungeness
18	Mary Russell	1	Near Misner Station
18	Merle	3	Dungeness
18	Providence	1	Off Ramsgate
	Carried forward ..	168	

Date, 1873.	Name of Ship.	No. of Cables broken	Where happened.
	Brought forward..	168	
Jan. 18	Prince	2	In the Downs
18	Surprise	1	Dungeness
18	Snaresbrook	2	In the Downs
18	Vere	2	In the Downs
18	Withsdale	2	In the Downs
18	Caroline Hutchins	2	In the Downs
18	Zetland	2	In the Downs
18	Britannia	2	Off Ramsay, Isle of Man
18	Laura Ann	1	Dungeness
18	Emile de Girardin	1	Not stated
18	Jacob de Han	2	Margate Roads
18	Jeanie Amelia	2	Not stated
18	Africa	1	Not stated
18	Mary Micheson	2	Off Lowestoff
18	Mary Ann	2	Off Lowestoff
18	Orion	1	Off Beachy Head
18	Rubens	1	Off South Foreland
18	Sarah	1	Aldborough Bay
18	Frances	2	Off Cape Cod
19	Margaret Macdonald	2	Off Cape Cod
19	Charles H. Kelly	2	Aspinwall
20	Maldon	2	Lowestoff Roads
20	Sophia Julia	2	St. Nazaire
20	Eliza	2	Girgenti Roads
20	Thor	1	Dungeness
21	Isabella Walker	1	Off Ramsgate
21	Winifred	4	Dar al Baida
21	Netherton	1	Dungeness
21	Sirius	2	Not stated
21	E. M. Legg	2	Sandy Hook
21	Harry Russell	2	Isle Dieu
21	Scotsman	2	Flatholmes, Bristol Channel
24	Iris	1	Portland Roads
25	John and Mary	1	Balcary Bay
26	Catherine	1	Near Holyhead
28	Pride of Canada	1	Mersey
30	Mary Ann	1	Near Ryde
31	Ann	1	New Ferry
Feb. 1	Anna Agatha	2	Cardiff Roads
1	Celine Marie	3	Penarth Roads
1	Friend's Endeavour	1	Portland Roads
1	Tibêr	1	Scilly
1	Joséphine Anias	2	Cawsand Bay
2	Mary	2	Mumbles
		241	

Date, 1873.	Nnme of Ship.	No. of Cables broken	Where happened.	
	Brought forward..	241		
Feb. 2	Francis 2d	1	Torbay	
2	Erin	2	Penarth Roads	
2	Stag	1	Clovelly Pier	
2	Louise	2	Isle aux Monies	
2	Ann	1	Rock Ferry	
2	Catterina	1	Penarth Roads	
3	Rosina	1	Goltrop Roads	
3	Benjamin Buck	1	Gravesend	
3	Amêlie	2	Camaret Roads	
3	Harkaway	2	Penarth Roads	
3	Stag	1	Morte Bay	
4	Amphitrite	2	Mount's Bay	
4	Kingalock	2	Morte Bay	
4	Mary E. Ray	1	Scilly	
5	Ann Law	2	Girgênti	263
6	Millwall	1	St. Helen's Roads	
7	Vivid	1	Hollesly Bay	
7	Notre Dame	1	Brest	
8	Mary Ann Hudson	2	Christchurch, N.Z.	
8	Richard & Elizabeth	2	Not stated	
8	United	1	Knoll sand	
11	Marathon	2	Not stated	
17	Lizzie Ann	2	Acre Bay	
22	Primrose	1	In the Downs	
23	Alice Vennard	1	Not stated	
25	Adelaide	2	Fishgard Roads	
25	Lady Agnes Duff	2	In the Mersey	
25	Eugenie	1	In the Downs	
25	Little Lizzie	1	Off Crookhaven	
25	Mary Elizabeth	2	The Mumbles	
25	Prosperity	2	St. Tudwell Roads	
26	Agile	1	Not stated	
27	Idalia	1	Off Elsinore	
27	Lucia	2	Not stated	
28	Margaret Jane	1	Seaford Roads	
28	Alice	2	Cardiff Roads	
28	Sarah Bungeat	1	Scilly	32
		295		

N.B.—For a list of Ships of War which have recently broken their chain cables, see plate 1.

In scanning the columns of "Maritime Intelligence," published daily, in Sir William Mitchell's excellent paper, one cannot fail to observe from week to week the continual list of casualties to shipping arising from the *parting* of their chain-cables *as at present constituted;* and the enormous loss of life and property which ensues by the breaking of *ordinary* Chain-cables is such, that the comparatively small additional expense attending the use of the *improved Chain-cable,* is not for a moment to be put in consideration with the value at stake.

The *ordinary* CHAIN-CABLE, as per Admiralty rules, is composed of bars worked into oval links, six times the diameter of the bar in length and 3·6 in breadth, having a cast iron stud or "stay pin" fixed across its centre to prevent the collapsing of the link when great direct strain is brought on the cable, but if this *oval* link gets caught on its edge in the nip of the hawse the *stud* tends to break the cable (see Plate II, Fig. 3).

For the Royal Navy the cable is made in lengths of 12½ fathoms, joined by a shackle one-tenth of an inch larger in its bar than the links, whilst the link at each end of the length, called the end link, is also one-tenth larger than the others with one swivel to every hundred fathoms. For the mercantile marine, the cable is made in lengths of 15 fathoms each, with a swivel in the middle, and the end links and shackles are also one-tenth larger; but chain-cables made on this plan, even of the *very best iron,* are liable to part in the *nip of the hawse* or across the stem, and, although instances are known of very tough iron bending almost to a right angle, in the nip, the link is pretty sure to break on getting a *direct* strain on it again.

The following table shews the sizes of cables for the different sized ships—both *steam* vessels and *sailing* ships—according to Lloyd's rules, with the quantity of cable required for each Class according to their tonnage, also the strain to be proved to, with Lloyd's new rules attached.

Sizes of Chain Cables with their length for tonnage and tested proof according to Lloyd's rules.

For Steam Vessels and Sailing Ships.

Numbers for Iron Steam Vessels. (See Note over.)	Ship's Tonnage.		*Numbers* for Iron Sailing Ships. (See Note over)	Stud Chain-cables.		
	Steam Vessels.	Sailing Ships.		Minimum Size.‡	Provd. to Admiralty Test, &c.	Length.
	Tons.			Inch	Tons.	Fathoms.
2750	75	50	2600	11/16	8 10/20	120
3750	112	75	3200	12/16	10 2/20	120
4670	150	100	3400	13/16	11 17/20	150
5420	188	125	3810	14/16	13 15/20	180
6170	225	150	4140	15/16	15 16/20	180
6840	262	175	4610	1	18	180
7500	300	200	5020	1 1/16	20 6/20	180
8750	357	250	6070	1 1/8	22 15/20	210
9800	450	300	6920	1 3/16	25 7/20	210

‡ In cases where parties are desirous of using or supplying *new* Chains of smaller size than is herein set forth, a reduction will be allowed not exceeding one-sixteenth of an inch in Chains of 1 inch to 1½ inch diameter, and one-eighth of an inch in Chains above 1½ inch diameter, provided they be subjected to the Admiralty

10800	525	350	7880	1 1/4	28 2/20	240
11830	600	400	8600	1 5/16	31	240
12750	675	450	9420	1 6/16	34	270
13670	750	500	10030	1 7/16	37 3/20	270
15400	900	600	11300	1 1/2	40 10/20	270
17000	1050	700	12500	1 9/16	43 18/20	300
18580	1200	800	13580	1 10/16	47 10/20	300
20160	1350	900	14620	1 11/16	51 5/20	300
21660	1500	1000	15600	1 3/4	55 2/20	300
24580	1800	1200	17500	1 13/16	59 2/20	300
27500	2100	1400	19320	1 14/16	63 5/20	300
30330	2400	1600	21100	1 15/16	67 11/20	300
33100	2700	1800	22720	2.	72	300
35750	3000 to 3750	2000	24400	2 1/16	76 11/20	300
....	....	2500	28300	2 1/8	81 5/20	330
....	....	3000	32100	2 1/4	91 2/20	360

Strain for the size for which they are to be substituted, and further, that a few links, not less than twelve, to be selected by the tester, shall be proved to the breaking strain, and show a margin of at least 10 per cent. beyond the Admiralty Proof, for a Chain of the full size required by the Table.

Letter from the Surveyor's Office at Lloyds relative to the Chain-cables and Anchors' Act, 1871.

CHAIN CABLES.

TESTING TO BREAKING STRAIN.

With reference to the proposed postponement of the operation of the Chain Cables and Anchors Act, 1871, the Committee of this Society HEREBY GIVE NOTICE, that they will adhere to the Resolution embodied in Notice No. 285, dated 14th December last, viz. :—

"That Chains tested up to the 1st July, 1872, under the existing Act at a Machine recognised by the Committee, will be accepted for any Vessel built, commenced, or contracted for *prior* to the New Act coming into force on the 1st July, 1872; and that all Vessels built, commenced, or contracted for *after* the 30th June, 1872, will be required to be supplied with Chains tested in conformity with the requirements of the New Act."

By order of the Committee,

(Signed) GEORGE B. SEYFANG,
Secretary.

2, *White Lion Court, Cornhill, London, E.C.*
13th May, 1872.

Note referred to in Table as to NUMBERS.

By Section 27 of the Rules, dated 24th February, 1870, for the Building and Classification of *Iron Ships*, it is provided that "Their *Equipment* is to be regulated by the *Number* produced by the sum of the addition of the half moulded breadth of the vessel amidships, her depth from the upper part of keel to the top of the upper deck beam, and the girth of her half midship section to the same height, multiplied by the vessel's length, for one, two, and three-decked vessels, and for spar-decked steam vessels."

For a vessel with an awning-deck, the Equipment Number to be increased one-sixth beyond that which it would be if she were flush decked and without an awning deck.

For a vessel with a partial awning deck, poop, topgallant forecastle, or a raised quarter deck, the equipment number to be increased one-tenth beyond that which it would be if she were flush decked.

The following paragraph appears in the *Shipping and Mercantile Gazette* of Saturday, 31st May, 1873:—

The Chain Cables Act.

"Yesterday a Deputation, appointed from the meetings of the Chain Cable Makers, held at the Westminster Palace Hotel on Tuesday, waited upon the Marine Secretary of the Board of Trade, to lay before him the resolution arrived at by the meetings, namely—" That whilst we approve of the principles of a public test as applied to all Chain Cables, and make no objection to the principles of the Chain Cable Act for the application of a breaking strain to Chain Cables in all cases in which such Chain Cables are intended for the use of British ships, it having proved to be impossible to carry on the export trade in Chain Cables subject to this breaking strain, owing to the great expense involved, we do now resolve that it will be necessary, in the event of further remonstrances with the Board of Trade proving fruitless, to disregard the Chain Cables Act in so far as it may apply to the export trade." The resolution was signed by various firms in the iron trade, and having connection with Shipping.

The Marine Secretary of the Board of Trade admitted that the Act required amendment; but there was, he said, no prospect of such an amendment this Session.

Another meeting of the Trade was afterwards held, at which it was resolved—" That in case of any of the names appended to the above resolution being prosecuted for the infringement of the Act in any *bona fide* case of the sale of Chain Cables *for export*, the whole of the above firms do hereby agree to divide among themselves the expense of defending such prosecution, and of any penalty that may be adjudged."

The Chairman was then requested to issue notices to the Trade that these resolutions would immediately take effect."

It is to be hoped that these gentlemen will be careful not to admit any *shoddy* makers into their society, for it appears that, "In Staffordshire for years a system has been resorted to which of itself would have heaped disgrace upon the buyers. Any speculator would buy a quantity of common iron and get cast a corresponding quantity of cast iron 'stay pins.' He would then call on a workman at his own little home, in the back yard of which would stand his hearth and bellows; an agreement would be made for 'the make,' which would be effected by himself, his wife, daughter, or little son, as it might be, striking to him and blowing his bellows; a ton of bolts would then be delivered to him with the necessary quantity of 'stay pins' at a price, and when completed, the Chain Cable (made as quickly as possible) would be returned to the owner of the iron at the agreed price, covering his labour, coals, and waste of iron in 'the make.'" Thus the manufacturers who had works, and charges of foremen, clerks, rent, taxes, &c., were obliged to sell at a price that compelled the manufacture of *cheap cables*, to be slovened in the same manner. No length of link was adhered to in a chain; no attention was paid to the keeping up of the diameter of iron at the weld; any weight of *cast iron* might be put in (for "stay pins") and no proving-machine ever saw this description of chain. "Thousands of tons were so brought to warehouses in Wapping, and readily bought by certain ship-owners and merchants *for exportation*." (*Extract from Transactions of the Institution of Naval Architects for* 1860, page 166.)

With a knowledge of the above facts before them the Committee at Lloyd's, it would seem, were quite justified in compelling the *Chain Cables Act* of 1871 to be carried into execution. Whether the act will be amended or repealed to meet the requirements or alleged grievances of the trade remains to be seen, but it certainly would be considered invidious for the Foreigner to be treated differently to the British shipowner in this respect, and it does seem very doubtful whether Chain Cables, without a *bona fide* test certificate would be, or *ought to be*, saleable in any part of the world.

The following 'Leading Article' on this subject is from *the Shipping and Mercantile Gazette* of Thursday the 12th of June, inserted after the foregoing remarks had been printed and paged.

"In 1871, in reviewing the Bill then before the House of Commons for amending the 'Chain-cables and Anchors Act', we pointed out what would be the effect on the Manufacturing and Shipping Trade with respect to the proposed alterations in the law. Section 11 of the Act of 1864 made it unlawful for any maker or dealer in cables or anchors to sell or contract to sell any Chain-cable whatever, or any anchor exceeding in weight 168 lbs., unless the same should have been tested and stamped. By the 7th Section of the 'Amendment Act' of 1871, it was enacted that no maker of or dealer in Chain-cables or anchors should sell, consign, or contract to sell or consign, nor any person purchase or contract to purchase, any cables or anchors, above 164lbs. in weight, unless for old iron, without their having been previously submitted to certain strains, and then stamped. Under the original Act, therefore, if cables or anchors were not sold for the use of vessels, they could be exported without undergoing the testing and marking process. By the omission of the word "vessel," and the prohibition against consigning or contracting to sell or consign, it was made illegal to export anchors or cables manufactured in the United Kingdom to any foreign Port under a penalty of £50. It is doubtful, also, whether unstamped anchors and cables can be consigned coastwise, unless for the purpose of testing and marking. In fact, the term "consign," which means making over to another, might be held to include removal by rail from a factory to a Port or warehouse. The law was stringent in order to prevent the selling of anchors and cables altogether in the United Kingdom, whether for ship's use or export, without their being tested and stamped under the provisions of the Act in that respect. It will have been seen from a report, which appeared recently in our columns, that a deputation from the manufacturers of cables and anchors waited upon the Marine Secretary to the Board of Trade to express the grievances of the makers, and to submit the following resolution.—(See page 39.)

"The manufacturers do not, it appears, object to the testing of anchors; but they find the cost of production so enhanced on the sale of chain-cables for export by the expense attending the testing and stamping, as to render it impossible for them to carry on their trade. This means that the cost falls as a charge on the manufacture, and to this extent places the British makers of Chain-cables on an unequal footing with foreigners in foreign markets. It was stated the other day that, in consequence of the high prices ruling in this country for iron, the Canadian merchants had discontinued their orders for the supply of that article from Great Britain, and were receiving their metal from the United States. The rate of wages having been raised in England, Wales and Scotland, and coke having gone up considerably in value from strikes, and combinations among colliery proprietors, it has been found impossible on the part of Chain-cable makers to compete, as regards price, with those countries where labour and material are cheaper. The British manufacturer, therefore, found himself met by dearer material in the first instance, and, secondly, he has to submit to the imposition of a tax on industry in the shape of a testing charge, and the expenses incident thereto, in conveying his cables to places where they have to undergo straining and breaking test. The manufacturers having resolved to disregard the law, in so far as relates to the export of Chain-cables, there is a likelihood of a conflict between them and the Board of Trade. All proceedings under the Acts of 1864 and 1871 for the recovery of penalties are to be taken in a summary manner before Justices of the Peace, therefore it remains to be seen whether the law will be enforced. The Secretary of the Board of Trade, it was said, admitted that the Act required amendment, but that there was no chance of dealing with the question this Session.

"It was argued in 1871 that, on principle, a manufacturer had no more moral right to sell untested Chain-cables to foreigners than he had to British subjects, and that if it was wrong to sacrifice the lives of British Seamen by imperfect chains, the permission to cast away foreign ships from a like cause was indefensible. There is certainly some force in these remarks; but it should be remembered that the testing system is not universally applied. It is also open to the Government of any State to forbid the introduction of untested cables, and to exclude their use when imported under laws similar to those in operation here. Again, the British stamp carries with it a certain *prestige*, and cables tested in the United Kingdon ought to command a higher price than those untested. If foreigners, however, are content to secure British-manufactured cables, relying on the name of the makers, it would seem unjust to deprive them of the advantages of purchasing such chains. The preference given to the British manufacturer may not altogether arise from price, but from quality and workmanship. The British Shipowner may not have any interest in supplying foreign Shipowners with cheaper chains than he can buy himself; but he is interested in the shipment of such articles, and in the Trade which it creates."

No doubt but a great many *shoddy* Chain-cables have been manufactured during the last fifteen or twenty years, and the makers it is said have managed *somehow* to hoodwink the authorities of the Board of Trade and Lloyd's as well as the Shipowners, by procuring certificates of *proof* and *efficiency* for worthless cables which have parted on the first occasion of severe trial! Nevertheless these exceptions will not account for the immense number of ships wrecked, and, *ergo*, loss of life and property which has taken place during this period owing to the parting of Chain-cables good, bad, and indifferent. On the 5th October, 1864, no less than 190 ships either *parted* their cables or drove on shore from their anchors or from moorings in the Hoogley during a cyclone, and a great many were totally wrecked with great loss of life. The author has been unable to learn what number of these casualties were actually due to the *parting* or breaking of the Cables; but an old naval Commander, who was present in Calcutta at the time, estimates one half of the losses to the *breaking* of mooring chains and Chain-cables, both good and bad—one fourth to *driving* on shore, the anchors not holding, and one fourth to loss at the warves by the breaking of chains, bollards, and hawsers. The melancholy loss of the steam ship

'Royal Charter,' with nearly 500 lives, and a large amount of gold on board, in October, 1859, must be in the recollection of every one. Had her Chain-cables—which were said to be very good—not parted after anchoring off the Welsh coast, she would not have gone on shore. The great danger of a Chain-cable *on the old plan* breaking—*let it be ever so good*—is when coming to an anchor and allowing the ship to run ahead of it with too much way on her, particularly with the present sharp bowed ships (sec Plate 2, Fig. 1 and 2); or in veering cable with a heavy sea during a severe gale, and *snubbing* or suddenly bringing the cable up by the stoppers or the end clinch when the ship's head has payed off by the wind acting on the bow, and bringing the cable across the sharp stem, or nipping it across the lip of the hawse-pipe as shewn in Plate 2, Fig. 3 and 4. It is supposed that this was the case on board the 'Royal Charter' when veering to the clinch after cutting away the masts.

The 'Great Eastern' parted her monstrous Chain-cable coming to an anchor in Queenstown harbour (Cork) a few years ago in quite moderate weather, by the Cable running too quickly through the stoppers and allowing her head to pay off by the action of the wind on the bow, so that one of the links parted across the sharp stem on *snubbing*, or bringing her up, although the greatest caution was observed on this occasion by her able and experienced Commander, Captain Paton; and there can be no doubt, but that this cable, made by one of the most excellent manufacturing firms in England,* was of the very choicest material, and of the very best workmanship. The S.S. 'Atrato,' with emigrants on board, in September of last year (1872), when coming to an anchor in Plymouth Sound in moderate weather, running ahead of her anchor as in Plate 2, parted the first cable in the nip of the hawse, let go the second anchor, and parted that cable also in the nip of the hawse. She narrowly escaped going on shore, not having a third anchor ready for letting go, but was saved by running away a large hawser to a vessel at anchor near, and for which a heavy salvage was paid. Her cables were said to be very good. No doubt "very good" according to the *old plan* of Chain-cable as set forth in page 35, but the Author is of opinion, which opinion is backed by a number of experienced, *practical* seamen, that had this ship, as well as the majority of the ships enumerated in pages 30 to 34 been supplied with his Patent Chain-cable, which has the strength of the iron at the transverse section where required, the parting of the Cables would not have occurred.

---

* Messrs. Brown, Lennox, and Co.

By a letter to the Editor of "*The Shipping and Mercantile Gazette*," dated 30th April, 1873, from Et. London, Cape of Good Hope, and published in "*The Shipping and Mercantile Gazette*" of 4th June, it is stated "That whilst the writer's ship lay at anchor there during forty days, weather favourable, but a strong sea rolling in, three ships *parted* their Cables, and that although the anchorage is very good yet it is *dangerous* from the fact that it is full of old anchors." Several of Her Majesty's ships have broken their cables within the last few years, mostly in the nip of the hawse (see Plate 1, for list of recent breakages). It has been supposed that these breakages *may* have arisen from the iron having become crystalized by the action of running round the bitts and through the stoppers after a certain number of years, like the axles and tyres of railway engines or carriages; but there is little or no similarity between the two, and this conclusion to account for the breakage appears very doubtful. Many old Chain-cables, which have been in constant use on board the bluff bowed sailing colliers between Newcastle and London for the last twenty years and upwards, made originally of the best cable bolt, by Messrs. Hawks and Co., of Gateshead, and other good makers, notwithstanding that they are reduced in size by continuous *rusting*, are still found to be tough and strong with no sign of crystalization, although running round the iron whelps of the windlass and through the compressors-deck and hawse-pipes, almost every day, year after year. The form of the bow, no doubt, has a great deal to do with the old colliers not parting their cables so frequently as sharp bowed vessels of the new school, nevertheless the *ordinary* Chain cable requires to be strengthened for overcoming the transverse strain in the nip of the hawse or stem, and the prevention of oxidisation or *rust*, both of which are provided against by the invention of the author of this little Treatise, as set forth in the specification of his Patent* as follows :—

* PATENT LAW AMENDMENT ACT, 1852.

(2. b.)
Certificate of Allowance of Provisional Protection. 364.

Office of the Commissioners of Patents for Invention.

"This is to Certify that Provisional Protection has been allowed to George Peacock, of Regent House, Starcross, in the County of of Devon, Ship Owner, for the Invention of "Improvements in Chain Cables" on his Petition, recorded in the Office of the Commissioners on the 30th day of January, 1873."

(4)
Certificate of Record of Notice to Proceed. 364.

"This is to Certify that George Peacock, of Regent House, Starcross, in the County of Devon, Shipowner, has given notice, of his intention to proceed with his application for Letters Patent, for the Invention of "Improvements in Chain Cables" as set forth in his Petition, recorded in the Office of the Commissioners of Patents for Inventions on the 30th day of January, 1873, and the Stamp Duty of Five Pounds has been paid on this Certificate pursuant to the Act.'

Dated this 2nd day of June, 1873.

SPECIFICATION

FOR

CAPTAIN GEORGE PEACOCK'S PATENT CHAIN-CABLE.

"Improvements in Chain-cables."

I, **George Peacock**, of **Regent House, Starcross**, in the County of Devon, Shipowner, do hereby declare the nature of the said Invention for "Improvements in Chain-cables" to be as follows :— "In making Chain-cables, according to my invention, I use the best nail-rod or chain-rod or cable-bolt iron, either Lowmoor, Farnley, or Bowling, or other iron rods or bolts, acknowledged to be equally good, fagotted and rolled or hammered into round bars of any required size; and from these bars I form the chain-links. The said links are to be welded in the usual manner on one side, but instead of being made in the ordinary *oval* shape and provided with cast iron studs or "stay pins" extending between their middle or central position, they are either to be closed at their middle and formed into eyes at each end, the said eyes being of such a size that the links can work freely within each other, having a continuous band or hoop of iron,oval shaped in *transverse section,* welded around the said closed or central position of the link, being smoothed and furnished with a suitable swage tool (see Plate 1.) *Or* instead of a continuous band, the link is *not* to be closed in the middle, but to be of an ovalated, elongated, oblong shape. (the strongest form of link) and to have a wrought iron bulbous cross-bar band welded on between and upon the sides of the link chamfered off at the outer edges or sides of said link, so as to make it *lighter* than a continuous band, although equally strong and answering the same purpose of *preventing the Cable from breaking in the nip of the hawse* (see Plate 4). The size of this bulbous cross-bar band, I propose to be one and three-quarter inches thick in the middle for a one-inch Cable, and three and a half by two, or two and a half inches broad, extending right across the link, ovalated or rounded off edgeways, *in transverse section;* and these dimensions are to be relatively observed more or less in proportion to the size of the bars for making the links of larger or smaller cables. The dimensions, I prefer, for the links of *one inch* Cable are—seven inches in length of link by three and half in breadth; and for a two and half bar-cable, sixteen inches by eight, keeping the *breadth* of links for all sizes *uniformly* half their *length* (see Plates 3 and 4). But I do not confine myself to any *fixed* or *specified* dimensions as to the thickness of bar, these being regulated by authority.

In the former instance of continuous band the interstices at the upper and lower portions of the links, within and adjacent to said band, are to be filled in with a metallic alloy, composed of tin and zinc in certain proportions, which will protect the Cable from oxidisation or *rust*, and give it a smooth, finished appearance (see Plate 1); *or,* if a welded bulbous cross-bar band is used, uniting in a homogeneous mass the two sides of the ovalated elongated link by welding, then to effect the same object, as to preventing oxidisation or *rust,* a hole is to be punched or drilled in the centre of the bulb of cross-bar (see Plates 3 & 4), tapering outwards or counter sunk and to be filled with molten alloy. If using the first-named kind of link, I may form the same of wrought iron by bending the links into an S shape, the ends being left long enough to wrap and weld round the central or closed portion forming the continuous band; or I may form the links by bending the same into the shape of the figure of 8 after welding, and *then* bringing on the band separately; or I may use rolled bars of the entire breadth and thickness of the links, including either the continuous band or the cross-bar bulb-band, punching out the eyes and joining and welding the same at every alternate link. The continuous band or welded cross-bar bulb-band may be made of the same kind of iron as the links, or from other suitable but commoner iron rolled to the form required. The sizes of the iron bars to be used in the construction of these Cables will be according to the Admiralty regulations, Lloyd's rules, or the Liverpool rules, and the custom of the trade. Swivels and shackles of ordinary construction may be used with my links, but I prefer a shackle with either a continuous band around it, *or* a bulbous cross-bar band welded on to its sides, chamfered off to a feather edge the same as the links; and the said Cables may be made in lengths of from twelve and a half to fifteen fathoms, or upwards if desired. The aforesaid continuous band or welded cross-bar bulb-band around, between, and upon the centre of the links, as the case may be, will prevent the *parting* (breaking) of the Cable in the hawse by the ship running ahead of her anchor with too much way on her, or ranging in a strong tideway when blowing a heavy gale of wind in a roadstead, causing the links to fall across the lip of the hawse pipe at acute angles, or across the stem, &c. (see Plate 2.) All the links, shackles, and swivels are to be of *equal* length throughout, so as to ensure regularity of grip at the capstan or windlass whelps."

GEORGE PEACOCK.

REGENT HOUSE, STARCROSS, DEVON,
***January* 10*th*, 1873.**

For the sake of uniformity, simplicity and economy combined with strength and efficiency, the Patentee would beg to suggest that instead of twenty-five different sized Chain Cables, as per table at pages 36 and 37, there should only be sixteen sizes altogether established for sea-going ships according to their tonnage, and that no difference should exist between steam vessels and sailing ships, as it frequently happens that the former get disabled in their engines before requiring to come to an anchor in an exposed anchorage, and, if paddle-wheel steamers, will have considerably more strain on their cables in a seaway than sailing ships of equal tonnage.

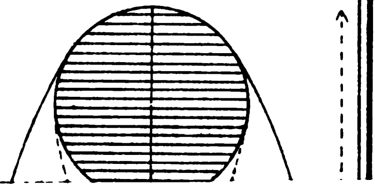
The relative length and breadth of link should be proportionate to size of bar iron used according to Lloyd's rules. They should be slightly ovalated oblongs, (see plate 4—the strongest form of link as per test) beginning at ⅝ bar 5½ inches long by 2¾ wide, for ships of from 50 to, and not exceeding, 100 tons, up to 2½ bar with links 16 inches long by eight wide, for ships of from 6000 up to 6600 tons, (see plate 3) all the links, shackles and swivels to be of equal length and every link uniformly half its length for breadth; and these relative dimensions to embrace only eight different sizes for *length* of link, so that only *eight* different sized capstan or windlass bodies would be required for gripping the cable in shortening in, and weighing the anchor; and only eight different sized stoppers, for all the sixteen different sized Chain Cables. It is also suggested that for *all* ships, whether steam vessels or sailing ships, four fixed lengths of cable only should be required according to size of ships, say 350, 250, 150 and 120 fathoms; the rule for "*numbers*" could still be adhered to, (see page 38). The particulars of this proposed uniform arrangement, for corresponding tonnage, &c., are set forth in the following table :—viz.

Proposed proportionate sizes and lengths of PEACOCK'S PATENT CHAIN-CABLE for all descriptions of Ships, from the largest Iron-clad Ship of War—Steam or Sailing Ship—down to the Coasting Vessel of fifty tons.

Size of Bar-iron for Link	Length of Link	Breadth of Link (extreme)	Size of welded cross-bar bulb-band			Space between Links in middle and at ends	Rounded off at top and bottom of cross-bar band to	Number of size for Capstain or Wind-lass body	For the use of Ships of	Length of Cable required
			Cross breadth (extreme)	Depth	Transverse thickness					
Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	No.	Tons	Fathoms
2½	16	8	6½	4½	3¾	3 by 2¾	1	1	6600 to	350
2⅜	16	8	6½	4½	3¾	3¼ ,, 2⅝	1		5000	
2¼	15	7½	6	4	3½	3 ,, 2½	1	2	4000 to	
2⅛	15	7½	6	4	3¼	3¼ ,, 2⅜	1		3000	
2	14	7	5½	3½	3	3 ,, 2¼	¾	3	2400 to	250
1⅞	14	7	5½	3½	3	3¼ ,, 2⅛	¾		1800	
1¾	13	6½	5¼	3	2¾	3 ,, 2	¾	4	1400 to	
1⅝	13	6½	5¼	3	2½	3¼ ,, 1⅞	¾		1100	
1½	11	5½	5	3¾	2¼	2½ ,, 1¾	⅝	5	850 to	150
1⅜	11	5½	5	3¾	2	2¾ ,, 1⅝	⅝		600	
1¼	9	4½	4¼	2½	2	2 ,, 1½	⅝	6	450 to	
1⅛	9	4½	4¼	2½	2	2¼ ,, 1⅜	⅝		350	
1	7	3½	3¼	2¼	1¾	1½ ,, 1¼	½	7	250 to	120
⅞	7	3½	3¼	2¼	1⅛	1¾ ,, 1⅛	½		180	
¾	5½	2¾	2½	2	1¼	1¼ ,, 1	⅜	8	150 to	
⅝	5½	2¾	2½	2	1¼	1⅛ ,, ⅞	⅜		50	

PLAT

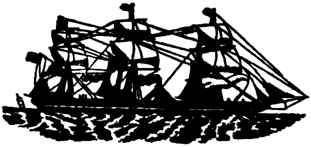
SLIABLE.



APPENDIX.

Seeing the importance of lending a helping hand in preventing the terrible loss of shipping and valuable lives at sea, a subject which is at present engrossing the attention of the public and the legislature, the author of this little treatise, being an old *practical* seaman and amateur engineer, ventures to add the following Correspondence as an appendix to the book, in order that it may be thoroughly ventilated by those interested: for although it has been already published in that excellent naval newspaper, "*The Shipping and Mercantile Gazette,*" upwards of four years since, and has also been before the Board of Trade, probably very few have read the letters; whereas by inserting them here they may possibly stand a chance of not only being read but may also, perhaps, be acted upon, and prove the means of preventing, as far as possible, such dreadful loss of life and valuable property at sea so sadly to be deplored; a fate that both steam vessels and sailing ships are at any unexpected moment liable to, let them be ever so "*tight, staunch, and strong,*" well equipped—in gallant trim—and in every respect perfectly Seaworthy, which every *respectable* Ship Owner is ever ready to carry out, even beyond the Government requirements, notwithstanding the overcharged *clap trap* and mischievous untruths which have been recently promulgated to the contrary, by a well meaning, would-be, philanthropist, who really knows little or nothing of the subject on which he presumes to write, but draws largely on his benevolent imagination, and jumps at conclusions formed in his credulous theoretical noddle on bare superficial facts, vamped up by interested or evil-disposed persons; however, like the once celebrated American Authoress, who drew so graphically upon the imagination, and managed to invoke the sympathies of innocent Old Ladies of both sexes, in the sensational novel of "Uncle Tom's Cabin,"—let us hope that *some good* may even arise from the publication of "Our Seamen," if only to awaken the energies of the Board of Trade; although the officious author, in his simplicity, has probably by this time discovered, like the Bear in Æsop's fable, that he had perhaps—better have let the *Bees* alone!

Sed enim "Nemo mortalium omnibus," etc., etc.



Important to Mariners, Ship Owners, Ship Builders, Naval Engineers and Underwriters.

WATERTIGHT BULKHEADS IN THE EXTREMITIES OF STEAM AND SAILING SHIPS.

From the *Shipping and Mercantile Gazette*, of December 17, 1868.

To the Editor of the *Shipping and Mercantile Gazette.*

" Sir, - Watertight bulkheads in every class of ship, whether of iron or wood, sailing ship or steamer, have always been advocated by the writer for the last 40 years, particularly at the extremities, namely, at the fore peak and after lazaretto rising above the deep load-line. I had an opportunity of proving the advantage of the former in a ship I once conducted in safety for nearly 2,000 miles on a foreign station, some 27 years ago, with her wood-ends started and rocks sticking in her bottom; and when screw steamers first came out in 1840, I believe I had the honour of first proposing that the screw shaft should have a stuffing-box in this after lazaretto bulkhead, in the event of anything happening to the pipe in the stern post. Had such a simple plan been fitted to the Hibernia, no danger would have occurred after the accident happened to this fine ship, and we should not have had to record such a fearful loss of life and property. These vertical bulkheads, or divisions, in ships are no novelty, having been adopted by the Chinese from time immemorial, although we have no record as to whether they caulked them tight, with a view of safety to the ship; but this idea could not have escaped the ingenuity and practical brains of a man like Sir William Petty, upwards of 100 years ago, or of Mr. Barnard, the celebrated Shipbuilder of London, who, in 1779, after he had first planked over the holes in the bottom of the York (East Indiaman) from the inside, then lying a wreck on the rocks at Margate, on New Year's Day of that year, afterwards built a water-tight bulkhead at each extremity of the ship, and then got her afloat, and sailed her up to Deptford, in safety.—See *Philosophical Transactions*, Vol. LXX. [I believe, beyond the two bulkheads in the extremities all others are unnecessary, by doing away with holes through the bottom—for iron ships when stranded, as a rule, always begin to part at the midship bulk-heads, stripping like a sheet of postage stamps.—G. P.]

A great many years ago the writer patented a simple but useful practical invention, namely, to have no sea-cocks in any class of ship below the light load-line, nor bilge cocks (so called) below the deep load-line, but to have one small chamber on the inside of the ship, either within the water-tight stern division, or under the engineer's cabin; a sort of box, made of iron, attached to the side, of convenient dimensions, with one aperture through the ship's side, and a large screw-down valve attached, under the command of the Engineer, or a separate box on each side of the ship, one for each engine. Into this box, instead of a dangerous Kingston-valve through the ship's bottom, the boilers were to be blown—that is, the water changed every two hours at sea, and for feeding and blowing out or emptying the boilers. The bilge-cocks to be also at the command of the Engineer in his cabin, or at the end of the engine-room upper platform, with their exit at the deep-load line, and not down in the bilge, sometimes covered with water, and not to be got at.*

Although I had the pleasure of knowing the late Mr. Kingston, of Woolwich Dockyard, intimately from 1828 till he died, and do not wish for a moment to disparage his vast talents and practical ingenuity as a Naval Engineer, nevertheless I was led to consider the danger of having these unnecessary holes through the bottom of the ship, from a circumstance which happened in a steamer I commanded. A broken screw-patch bolt was blown out of the boiler and got jammed in the Kingston-valve cock, and it was cleared with some difficulty, not unattended with danger, by taking out the cock at sea and replacing it in the face of an upward and powerful column of water; and on one occasion, upon finding three feet of water in the engine-room, through one of the bilge-cocks having been inadvertently left open.

As my patents (now expired) have been of no value to me, not being a professional Engineer or Shipbuilder, I send you the above facts for the benefit of your numerous readers, in the hope that they may prove useful; and I shall be happy (if you will grant the space in your valuable Paper) to explain these essential and really important inventions, with others, more fully at some future opportunity. I enclose my card, and remain, Sir,

Yours obediently,
A RETIRED STEAM COMMANDER."

Starcross, Devon, December 12th, 1868.

From the *Shipping and Mercantile Gazette*, of January 20, 1869.

THE LOSS OF THE HIBERNIA.

To the Editor of the *Shipping and Mercantile Gazette*.

"Sir,—You were good enough to insert a letter from me on the above melancholy loss in the *Shipping and Mercantile Gazette* of the

---

* Steamers which take the ground in tidal harbours are also liable to get these appertures choked with mud and gravel, which frequently necessitates going into dry dock. I have known an iron steamer break into three pieces when slung for raising from the bottom, the chains having been placed in the wake of the midship bulk-heads with an idea of this being the strongest and best place to fix them.—G.P.

17th ult., and subsequently another letter bearing on the same subject, signed 'A Retired Steam Commander,' since which I have read, with great attention, your report of the investigation, held at Glasgow, into the cause of the Hibernia's foundering, also your able comment on the same, and, with your kind permission would beg to call the particular attention to all Shipowners, Shipbuilders, and Underwriters to the great importance of having *bonâ fide* watertight bulkheads in the extremities of every ship afloat, as pointed out in my letter referred to. There can be no doubt that had the front part of the *so-called* watertight bulkhead, with a proper stuffing-box in it, extended up to the level of the saloon deck, with an iron water-tight deck beneath the wooden floor, having a scuttle for the Steward to have access to the lazarette so formed, fitted to be screwed down tight, if necessary, should the ship be *very* deep in the water, no harm could have happened to the ship if even the plates adjoining the sternpost had been started or bilged by the blows of the ponderous screw. All ships are more or less liable to have their sternpost or stem and forefoot started by striking the ground, and no doubt many ships, both of wood and iron, have been irretrievably lost by this cause, in the absence of properly-constructed *bonâ fide* water-tight bulkheads in their extremities.*

I am, Sir, your constant reader,

GEORGE PEACOCK, F.R.G.S."

Starcross, Devon, January 19, 1869.

SPONTANEOUS COMBUSTION OF COAL ON BOARD SHIP.

From the *Shipping and Mercantile Gazette*, of Friday, January 29, 1869.

To the Editor of the *Shipping and Mercantile Gazette*.

"Sir,—Observing a letter in the "Shipping and Mercantile Gazette," of Friday last (22nd inst.,) from a foreign correspondent recommending a method for discovering when coals get heated in a ship's hold, I beg to send you copy of a letter addressed by me to Messrs. John Holman and Sons, of Topsham, 23rd December last, on this important subject, which cannot be too much ventilated. The coincidence is somewhat remarkable. Messrs. Holman's fine new barque, the John Holman, took fire off Cape Horn in September, 1865, and Captain Saunders, of this place—a fine noble

---

*In the recent case of abandonment of the ship Calcutta, if the foremost bulkhead had been *bonâ fide* water-tight we should not have had to record the loss of life which took place previously to that fine vessel having been picked up derilect by H.M.S. Terrible. There are almost daily occurrences, where ships are lost by starting their stern posts or running stem on upon rocks, carrying away the forefoot and foundering, that a *bonâ fide* water-tight bulkhead in the extremities would have prevented.—G.P. March 1, 1869.

fellow—with all his crew, no doubt perished miserably on that occasion, as they have never been heard of since.*

I am, Sir, yours obediently,
Starcross, Jan. 25, 1869. GEO. PEACOCK, F.R.G.S."

To Messrs. John Holman and Sons, Topsham.

"Dear Sirs,—Referring you to my letter in the "Shipping and Mercantile Gazette," of 17th inst., signed "A Retired Steam Commander," it occurred to me to send you a description of my plan of ascertaining from time to time, at sea, the condition of a ship's cargo when laden with coals, and, if found to be in a state of ignition, the means of promptly extinguishing the same, knowing you have been sufferers by such calamities, recurrences of which, it is melancholy to see, are accumulating daily!

"In the month of October, 1840, the ship Portsea, laden with a cargo of coal for the Pacific Steam Navigation Company, took fire off Cape Horn. With great difficulty the Captain managed to open the hatches, and throw overboard a considerable quantity the ignited and heated coal, and by pouring water into the hold down the hatchways he succeeded in bringing the ship safely into Valparaiso, where the remainder of the cargo was discharged, when it was found that several of the hold beams and stancheons were burnt through and the ceiling charred in many places.

"I was Marine Superintendent of the Pacific Steam Navigation Company at that time, and then suggested (28 years ago) that all coal ships in future should have a wrought-iron gas-pipe, two inches in diameter, fitted up and down the stancheons, leading up to the fore side of the fore hatchway-combings on deck, also one at the afterpart of the main hatchway combings, and one abaft the mizenmast leading into the saloon or cabin—the latter with a stationary thermometer fixed at its top, the other two pipes to have screw-caps on them flush with the top of the combings and sufficiently clear to allow of battening down the hatches. These pipes to be perforated, say 10 feet up from the keelson, so that, by unscrewing the caps at sea, a common bath thermometer might be occasionally lowered down in order to prove the exact temperature of the hold.

"A sea-cock or screw-down-valve, to be fitted in all coal-laden ships at the light load-line, protected by an iron covering inside, with a lever rod for opening or shutting, boxed off from the ship's ceiling, leading into the Captain's state room, with an index plate and handle under lock and key, so that it could be opened or shut only at the discretion of the Captain; and these deck pipes might also be used for pouring down water, by hose or funnel, without opening the hatches, in the event of fire. It must be borne in mind that, although apparently by the sounding-rod five or six feet of water or more might be let into the ship, the quantity of water would merely occupy the interstics of the coal, and after quenching the fire could be easily pumped out.

---

* A letter was received by Messrs. Holman from Captain Saunders stating that the "John Holman" was on fire, but although the ship which brought the letter offered to take the crew on board, the captain would not leave her, and his gallant crew stood by him in the vain hope of reaching the Falkland Islands, then within a day's sail.

"The cost of such simple appliances would scarcely exceed £10, and I would strongly recommend that all coal-laden ships should be compelled to have some simple, inexpensive plan af this sort fitted to them.

"I send this practical plan of mine for your consideration, as you are so extensively connected with Shipping and interested in Insurance, in hopes, that, by your setting the example, it may lead to general adoption for the benefit of the Mercantile Marine. You can make any use you please of this communication; and as I have no doubt you file the "Shipping and Mercantile Gazette," it might, perhaps, be worth your while to ascertain the exact number of coal-laden ships which are known to have been burnt at sea, damaged, or missing during the last 12 months only, with their names, tonnage, and value, for the information of the Board of Trade. I have an idea that the list would be found to be something alarming as to the value of property, and *apalling* as to the loss of many valuable lives.

I have the honour to be, Gentlemen, yours faithfully,

"GEORGE PEACOCK."

Topsham, December 28, 1868.

"George Peacock, Esq., Starcross, Devon.

"Dear Sir,—We have perused your favour of the 23rd inst., and much approve of the simple method of ascertaining the degree of heat in a coal cargo, and of extinguishing fire by a sea-cock fitted above the light load-line. The Mary Ann Holman is *now* at Monte Video in consequence of her cargo of coals having ignited. She was fitted with ventilators running 60 feet along the keelson, with two upshafts or funnels two feet square, and leading through the main and after hatches. The method adopted by the Captain was to let several feet of water in to the ship by boring holes, and, when the fire was got under, by lightening, and again drowning the cargo from above. By the use of a sea-cock a more ready and less dangerous means than boring holes would always be available. We purpose laying your letter before our Committee at their next meeting.

We are, dear Sir,
Yours truly,
(Signed) JOHN HOLMAN & SONS.

From the *Shipping and Mercantile Gazette*, of **Friday, February 19,** 1869.

"Our Cardiff Correspondent a few days ago informed us that a letter from certain Underwriters was read before the Chamber of Commerce at Cardiff, calling attention to the fact that, last year (1868) **one hundred and sixty laden vessels** were burnt at sea! and, whilst asking the cause, stating that they would not, in future, insure vessels laden with coal which had a tendency to spontaneous combustion."—Editor of the *Shipping and Mercantile Gazette.*

THE LOSS OF THE PERSIA BY FIRE.

To the Editor of the *Shipping and Mercantile Gazette*

"An enquiry has been recently held at Mauritius, presided over by Captain Wales, Harbour Master, into the loss by fire of the ship Persia. This vessel was from England bound to Bombay. Her cargo, consisting of coals, took fire in lat. 40 S., and long. 21 E., and the captain and crew abandoned her when she was in flames to seek refuge on board the Blackwatch. The captain was exonerated from all blame, but what is worthy of attention by men of science and all interested is the concluding passage of the Report of the Board as follows:—

"In reference to this loss the Board would remark, that in their opinion the burning of coal-laden vessels demands the serious investigation of scientific men. These fearful accidents are increasing in frequency, and spontaneous combustion is hardly a satisfactory conclusion to arrive at. Why is there spontaneous combustion? Why does one ship burn from that cause, and dozens of others laden from the same pit, at nearly the same time, arrive safely at their destination. Is ventilation of the coals advisable or dangerous? Ought hatches to be kept on or off? Could not inflammable gases be pumped out of the ship's hold? Is there not a method of creating gases in an inexpensive manner on board ship that would smother and extinguish any amount of fire in a vessel's hold? Such measures are spoken of commonly enough, but are apparently never carried into practice. Three large coal laden vessels, the Pernix, Volante, and the Persia, having been burnt at sea, and their crews arrived in this colony during the last year. What destruction of property, what risk to life, what privation and suffering do these burnings entail? At this moment there is a valuable vessel in this port, coal laden, which narrowly escaped the same fate as the Persia, the coals having been smouldering many days before they could be extinguished. The Board submit these remarks for consideration, and hope that the very important subject, they refer to may be thought worthy the attention of competent persons. Certainly any one who will point out the way in which coals may be conveyed to distant ports without greater risk than the generality of cargoes will have deserved well of Owners, Sailors, Underwriters, and last, not least, of humanity."

PLATE 1ST

PEACOCK & BUCHAN, MANUFACTURERS,
Southampton, & 39. Upper East Smithfield, LONDON.

EXPOSITION MARITIME INTERNATIONALE DU HAVRE
PEACOCK & BUCHAN
1868

PEACOCK & BUCHAN
INVENTORS
AND
TRADE MARK
MANUFACTURERS
OF COMPOSITIONS
FOR SHIPS' BOTTOMS
&c.

NAPOLEON III EMPEREUR
S.A. LE PRINCE IMPERIAL

啟者本行開張畏談頓鎮即是英國海口一個城是大火輪船出入世界四方亦有棧在倫頓異士密替腓爾上分三十九房由本處無所不遠國有船到來本行製作新漆用以船底防禁海之藻海蟲甲魚粘着穢船底所以可過海回家不必入槽中淨弄乾修用此漆船底是甚要緊因爲可走海十餘月不須入槽中修船底故是英國鐵行所用英國外國船會都用如今御船槽在歐洲不須贊美有名的船家常用而証其善漆是至好在法國近收御票　故蒙貴客請觀本號皮各芭與干公司好

Translation of Messrs. Peacock and Buchan's Chinese Advertisement in the *Flying Dragon Reporter.*

We beg to state that our firm is established in the Town of Southampton, an English seaport where large steam vessels enter and depart,—go and come to all quarters of the world, and ships from countries of any distance come hither. We also have a warehouse in London at 39 Upper East Smithfield. We have invented a new composition paint to be applied to ship's bottoms, to prevent seaweed and shellfish from fouling them, and consequently a ship may cross over the sea and return home again without being obliged to enter a dock to be cleansed. The employment of this composition to lay upon the great ships is very important, for a vessel may then sail upon the sea for ten or twelve months, without it being necessary to enter dock to repair the bottom. The Peninsular and Oriental Steam Navigation Company, together with nearly all other Steam Packet Companies in England and Foreign Countries, and also many private shipowners besides, now use this Composition. It is also now being used in many of the Royal Naval Dock yards of Europe. But it is not necessary to praise it for many eminent shipbuilders have borne their testimony to the excellence of this Composition, and it is certified as the best in the Royal Naval as well as Mercantile Dock-yards ; therefore we shall feel obliged if our honoured customers will carefully observe our Trade Mark, and then there will be no mistake, We solicit them to send their orders through an EnglishMerchant ;—that will do.

For this very purpose we give the information.—

Contractors to the Government & the India Board.

EXPOSITION MARITIME INTERNATIONALE DU HAVRE
PEACOCK & BUCHAN
1868

Havre Exhibition

PEACOCK & BUCHAN
INVENTORS
AND
TRADE MARK
MANUFACTURERS
OF COMPOSITIONS
FOR SHIPS' BOTTOMS
&c.

Prize Medal.

PEACOCK AND BUCHAN'S

Nutritive No. 2 Composition Paint

FOR IRON SHIPS

Used GENUINE is the Best and Cheapest "Anti-fouler" extant—Contains no Copper, or other injurious ingredient.

Established 1848.

It has long been a well known fact that an IRON SHIP COATED with PEACOCK AND BUCHAN'S genuine ANTI-FOULING COMPOSITION can MAKE a VOYAGE ROUND the WORLD and RETURN with a CLEAN BOTTOM, WITHOUT DOCKING ABROAD. This has been twice accomplished by H.M. Steam Troop Ship "HIMALAYA," viâ Ceylon, Singapore, China, Australia, and New Zealand, which ship has used this Composition exclusively for the last 20 years. Numerous Iron Sailing Ships have also returned from India and the West Coast of South America with PERFECTLY CLEAN BOTTOMS, after an ABSENCE of from TEN to FOURTEEN MONTHS, with out docking, careening, hogging, lying aground, or going into freshwater abroad.

It contains NO COPPER or other ingredient injurious to the plates and rivets, and is used by the Iron Fleets of the Peninsular and Oriental, The Royal Mail (W. I. and Bz.), British India, The Royal Mail (Pacific) Steam Navigation (Liverpool), The Transatlantic and Australian Steam Companies. Also the Mauritius and Cape Steamers, and many other great Steam Ship Companies, British and Foreign, in all parts of the World; likewise by a great many Iron Sailing Ships, after numerous Competitive Trials with *every* other known "Anti-Fouling" preparation of the day. *(See Pamphlet "On the History of Iro Ships and their Fouling, &c." Sent free on application by enclosin six stamps.*

Instances have occurred that where preparations containing Copper or Mercury have been used, and rubbed off in parts by abrasion, holes have been eaten through the plates by *Galvanic action.* No less than *thirty-two* Antifouling Compositions have been tried and rejected in competition with Peacock and Buchan's at He Majesty's dockyards. H.M. troop-ship "Himalaya's" plates an rivets have lately been minutely examined, and found to be a perfect as when she was first built.

Shipowners are now alive to the importance of using Peacock and Buchan's Composition GENUINE, and avoiding PREPARATIONS COPPER AND MERCURY, after the fearful destruction recently evince by galvanic action on the plates and rivets of many iron an composite ships.

N.B.—It is about the same price as the best (minium) red lead, wh properly mixed for use, taking into consideration the difference quantity required weight for weight. It may be laid on over AN *ordinary paint for priming, but red lead when dried hard is consider to be best for an undercoating,* **although no undercoating is real necessary with this Composition.**

With the experience of many years' active study, and th experimental trials which Messrs. Peacock & Buchan have made and co still to make, from year to year in the Exe and Southampton waters, on seagoing ships to every quarter of the Globe—carefully avoiding prepa of *copper*, and every ingredient injurious to iron—they have been ena effect such improvements in the original mixture as experience has and are NOW in a better position to produce the BEST ANTIFOULING AND PROTECTIVE COMPOSITION OF THE DAY than parties who bring out from time to time new *theoretical mixtures* tried by P. & B., and laid aside many years ago; such as the various chemical forms of arsenic, mercury and copper, also vegetable poisons, &c., &c., which are found by *practical* experience to be of little or no use in preventing fouling, whilst in many instances they cause great injury to the rivets and iron " plates. *Memo.—Several fine Iron Ships have been honeycombed very lately by a costly New Mercurial Composition prepared both in England and on the Continent.*

The COMPETITIVE TRIALS which have taken place between P. & B.'s GENUINE ECONOMICAL Compositions and other "*Anti-Fouling* preparations, so called, during the past twenty years, on the bottoms of Her Majesty's Iron Ships, also on the Iron Fleets of the various ROYAL MAIL PACKETS in the East and West Indies, in China, and the Mediterranean, Australian, Japan, and Pacific Seas, have all decided the superiority of the former, especially in *economy* and preservation of the plates and rivets, and in proof of which they have during the past year exported a still larger quantity to Foreign Dockyards, Mail Cos.' Depôts, and Merchants' consignments abroad, than in any previous year, and the consumption at home has also largely increased. N.B.—Upwards of twenty tons are now on order and more than sixty tons have been sent out from the Manufactory since 1st May, 1873, to this date June 9th, 1873.

Please see the Patent Capsule on the nozzle of the cans broken at the ships' side, for a great deal of Spurious Composition is sold as "PEACOCK'S COLOUR."

THE COMPETITIVE TRIAL between H.M. Troop Ships "Himalaya" and "Megæra" the former coated with Peacock & Buchan's "Antifouling," and the latter with McInnes' and Hay's Preparations of *Copper*, was most remarkable —both ships having been employed in similar service—and the contrast was pronounced by the Officers of the Dockyard as "*extraordinary*!" A copy of the Report, by the courtesy of the Lords' Commissioners of the Admiralty, was sent to Messrs. P. and B. from Whitehall.

During the last year a large supply of their *Anti-fouling* Composition has been sent to the Royal Dockyardsfor the use of H.M. Iron Ships; orders were also received to send a large supply to Bombay, and Hong-Kong, for the use of the P. & O. Co.'s Fleet in India; and also from the Pacific Steam Navigation Company for the use of their Iron Fleet in the Pacific. The Turkish Government has lately had a large supply for Constantinople; also the Prussian, Portuguese, and Egyptian Governments, &c. [See pages 7 and 8.]

DIRECTIONS FOR USE WILL BE FOUND PASTED ON EACH CAN.

N.B.—The corrosive action of copper and mercury on iron may be tested by the following simple process:—Get a bottle (about half a pint) of *oxychloride* of copper $^{\text{and}}_{\text{or}}$ of mercury, put a piece of iron in each, say ⅛ inch rod of iron, 9 inches or a foot long, and watch the action—the rod of iron will be tremendously corroded in 48 hours, and in a week or so fairly *dissolved!* H.M.S. Megæra had *always* been coated with preparations of copper or mercury, which become *oxychlorides* after immersion in *salt* water. This ship was run on shore in June 1871, on the Island of St. Paul, in the Southern Indian Ocean, to save life. It has since been proved that her bottom was eaten out by *galvanic action.* (See pages 15 and 16).

Messrs. Peacock and Buchan now have a Contract with the British Admiralty, also the India Board, and H.M. ships Himalaya, Sultan, Iron Duke, Monarch, Defence, Prince Albert, Princess Alice, Jumna, Thunderer, Tamar, and several other Government Ships have since been coated.

Some hundreds of genuine, unsolicited Testimonials from all parts of the world have been forwarded to Messrs. Peacock and Buchan from 1848 to the present day, 1873, sent by highly respectable parties, the originals of which are to be seen at the Office of the Manufacturers, Southampton; the following are fair samples.

From Philip Hedger, Esq., Dock Superintendent, Southampton.

Southampton Dock Company, Dock House, Southampton,
9th June, 1873.

Messrs. Peacock and Buchan.

Dear Sirs,—In reply to your letter I do not know how I can add or withdraw anything I have said on previous occasions as to the value of your Composition paints.

I have not seen anything used for coating ships' bottoms at this port to compare with your No. 2 Improved Composition, which I may say is *now* almost the only paint in use here. I have noticed from time to time during the last few years, numerous other preparations being used in *competition*, but as far as I can learn they have all proved to be failures. I have used your No. 2 Composition for coating our *Iron Caisson* with great success, and I have recently had our new *Iron Shears* painted with your No. 3 stone colour, and the result is *highly satisfactory.* My experience of your Composition extends over a period of more than TWENTY YEARS, and I see no reason to alter my opinion as to its still being the best thing extant for keeping clean and protecting the plates and rivets.

I am, dear Sirs, faithfully yours,
(Signed) PHILIP HEDGER,
Dock Superintendent.

From Messrs. Hacquoil Bros., Steam Ship Brokers,

Cardiff, June 12th, 1873

To Messrs. Peacock and Buchan, Southampton.

Gentlemen,—Enclosed, I beg hand you further testimonials from Messrs. Hacquoil Bros. here, which I think when placed with former will [illegible] great value.

Yours obediently,
(Signed) S. T. HUTC

Cardiff, 11th June, 1

Dear Sir,—About nine months ago we coated the ship Brittany w [illegible] your patent paint, we have have just placed her on the gridiron for th [illegible] se re-painting, and we are much pleased to report that her bottom was found quite clean and free from dirt. We have coated her again with the same paint (No. 2.)

Yours truly,
(Signed) J. HACQUOIL BROTHERS.

To Mr. Hutchins,
Agent to Messrs. Peacock and Buchan.

From Capt. E. M. Leeds, of the Royal Mail Company's Steamer "Tasmania."

Southampton, July 1st, 1871.

Messrs. Peacock and Buchan.

Dear Sirs,—In answer to your (Mr. Peacock's) letter of the 27th ult., referring to our conversation in Glasgow regarding the different qualities of Compositions for coating iron ships' bottoms, I have no hesitation in again saying that in my opinion your No. 2 Composition Paint is the best that has come under my notice. I have paid some attention to the matter, having commanded iron ships for the last eighteen years.

I remain, very truly yours,
(Signed) E. M. LEEDS,
Commander of the Royal Mail Company's Steamer "Tasmania."

From Capt. Richd. Revett, commanding the Royal Mail Steam Packet "Nile."

Shirley, Southampton, May 1st, 1871.

Messrs. Peacock and Buchan.

Dear Sirs,—You ask me to give you my opinion of your Paint for ships' bottoms, and I have no hesitation in saying that it is the best coating for ships' bottoms I have ever seen. It not only adheres longer to the bottom, but does not foul like many other Compositions. It has another and great advantage—such, that it can be applied in all weathers—and when it's impossible to get the ships' bottom thoroughly dry.

I am, dear Sir, yours very truly,
(Signed) RICHD. REVETT.

N.B.—The new iron Steam Packet "Nile," coated in April, 1870, with a very expensive preparation of mercury, *on trial*, was examined in June and had five more coats laid on—was again examined in November, 1870, and found to be in a *very bad state*. She was then scraped and coated with Peacock and Buchan's Composition, which has been used ever since.

Southampton, January, 1873.

From Capt. T. Bishop, commanding the Iron Ship "Halcione."

Ship "Halcione," London, May 2nd, 1870.

Messrs. Peacock and Buchan.

Dear Sirs,—Whilst in Wellington, N.Z., towards the end of last year, the iron S.S. "Taranaki," of about 450 tons, was towed across Cook's Straits from Queen Charlotte's Sound, where she had been lying sunk at the bottom in 17 fathoms of water for over 12 months, having just been raised. The topsides which had been simply painted with ordinary black had a *very thick incrustation of barnacles, &c.*, but below this all we could see of her bottom (coated with your Composition) was *perfectly smooth and* *clean*, and the Composition apparently quite intact. She had not been, I was informed, touched or cleaned in any way from the time of raising, which I believe was only a day or two. Should this account be of any use to you, you are quite welcome to make it public. For myself, I have a very high opinion of your Compositions, when put on properly and not tampered with. My Chief Officer also bears testimony to the above.

I remain, dear Sirs, very truly yours,
(Signed) THOS. BISHOP,
Master of Ship "Halcione."
(Signed) ROBT. WRIGHT,
Chief Officer.

From M. A. Picard, Havre.

Havre, le 26 Avril, 1873.

Je déclare avoir depuis plusieurs annie employer fréquement per la Coque des stéamers et navires en fer, la Composition No. 2 de Messieurs Peacock et Buchan, de Southampton, et pouvoir par plusieurs experience certifié la supériorité sur toutes les autre Composition, que jai deméme employi dans le même, but de preserve le fer de l'oxidation, des coquillage et maintenir la propréter, et la conservation, resultat qui jé nai obtenu qu'avec la Composition de Messieurs Peacock et Buchan.

(Signé) A. PICARD,
Entrepreneur de Peinture au Havre.

[TRANSLATION.]

From Monsr. A. Picard, Master Painter of Havre.

I declare that after frequently using for many years on the bottoms of Iron steamers and sailing ships, the Composition No. 2 of Messrs. Peacock and Buchan of Southampton, and proved it by great experience; I certify it to be superior to all other compositions that I have employed for the same purpose: the object being to protect the iron from oxidisation, also from shell fish, and keeping it clean and in preservation.

Results that I have never been able to obtain, but with the Composition of Messrs. Peacock and Buchan.

(Signed.) A. PICARD,
Havre, 6th April, 1873. Master Painter of Havre.

From Messrs. St. Ange Richon & Co., Bordeaux. (Translated.)

Messrs. Peacock & Buchan, Southampton.

Gentlemen,—Your esteemed favour of 2nd of this month arrived here on the 12th. We beg impressively to state, that we have been always highly satisfied with the results of your Composition paint which we have used for many years as a preservative against the adhesion of vegetable and animal substances upon the bottoms of our iron ships. We salute you with consideration.

(Signed) ST. ANGE RICHON & Co.

From the "Daily News," of 18th January, 1871.

"PORTSMOUTH, January 17th.—The "Himalaya" troopship has just completed another 10,000 miles. The passage from Halifax to Queenstown was performed in nine days and half-an-hour, the troopship beating the mail steamer by one day. Her next voyage will be to the Mediterranean."

N.B.—H.M.S. "Himalaya" was coated last year with Messrs. Peacock and Buchan's "Anti-Fouling Composition" before leaving for the West Indies, and is now found to be so clean that she does not require to be docked again on commencing her new trip this year. This beautiful ship has lately returned again from a tempestuous voyage to Halifax, &c., and has just been refitted and recoated in dock at Devonport as before—15th April, 1873.

Memo. fromthe Shipping and Mercantile Gazette.

"The fine large iron *sailing* ships "Helen Stuart" and "Kingston," belonging to Messrs. Stuart and Douglas of Liverpool, having been *both* coated with Messrs. Peacock and Buchan's Composition *genuine*, made the voyage from London to Calcutta and back to London last year, each within seven months, including discharging and loading; they were not docked in the country and came home in heavy drafts of water." 1st May, 1873.

From "Shipping and Mercantile Gazette," Friday, April 14th, 1871.

H. M. troopship *Tamar* having been docked at Devonport to be coated with Peacock and Buchan's anti-fouling composition before leaving for Japan, has arrived at Portsmouth. H.M.S. *Monarch*, after receiving a coating of Peacock and Buchan's anti-fouling composition, was undocked on the 8th, and proceeds immediately to Spithead to join the Channel Fleet, which, it isreported, will go to sea for a cruise as soon as the ships have been inspected by the Lords of the Admiralty.

The following orders lately received by Messrs. Peacock and Buchan will show the estimation in which their Compositions are held:

"No. 242,—Number of Demand 162 E, 30th April, 1873.

Admiralty, 20th May, 1873.

Gentlemen,—I have to request that you will deliver into Store at Her Majesty's Dock Yard at Devonport, the undermentioned Articles:—

Peacock's Anti-fouling Composition for Iron Ships, No. 2. .. 100 cwt. (or 5 tons)

(Signed) F. W. ROWEL,
Superintendent of Contracts.

Messrs Peacock and Buchan, Southampton,

"No. 172,—Number of Demand 162 E, 3rd May, 1873.

Admiralty, 23rd May 1873.

Gentlemen,—I have to request that you will deliver into Store at Her Majesty's Dock Yard at Chatham, the undermentioned Articles:—

Peacock's Composition for Iron Ships, No. 2—35 cwt.

(Signed) F. W. ROWEL,
Superintendent of Contracts."

Messrs. Peacock and Buchan, Southampton.

British India Steam Navigation Conmpany Limited.
13, Austin Friars, E.C.,
London, 24th May, 1873.

Messrs. Peacock and Buchan, Southampton.

Gentlemen,—I have to ask that you will prepare for immediate shipment to Calcutta via Suez Canal two tons of your No. 2 Composition, and for Bombay via Suez Canal 2 tons.

Please inform me when the goods are ready to be sent to the Docks.

Yours obediently,
(Signed) T. MACNAUGHTON,
Secretary.

Extract from Messrs. Laughton's letter of 12 May 1873. "We are instructed by the authorities of the Turkish Imperial Arsenal of Constantinople, to request that you will forward immediately to the Imperial Arsenal for the use of the Turkish Iron Fleet, the following quantities of your Anti-fouling Compositions viz:—

140 drums of 1 cwt each of your No. 2, Anti-fouling Composition, and 280 drums of your Top-dressing or exfoliating soap mixture. "The Turkish Government, through us, have now used your Composition for many years past, so have the Turkish Ocean line of Steamers "Chirket-tizzid;" also the Bosphorus Steam Co., "Chirket-Aairu." These are all iron Steamers requiring your paint; and they afford the best proof of its efficacy by the continued use of it."

For Price and all Particulars apply to PEACOCK & BUCHAN, SOUTHAMPTON, or their sole and exclusive Vendors in all the Seaports of the World.

PREFACE

TO

PEACOCK & BUCHAN'S

NINTH EDITION OF THEIR PAMPHLET FOR 1873.

Ever since the first introduction of Iron Ships into the Naval service of the world, there is scarcely a Shipbuilder or Commander who has not attempted—with laudable zeal—to produce some specific of his own against the adhesion of barnacles, coraline, weeds, &c., called "FOULING."

The experiments tried on iron bottoms to and from all parts of the globe from year to year, by theoretical charlatans or experimental enthusiasts, with every conceivable material, have hitherto failed to produce anything equal to the well-known "*Anti-fouling*" Composition of Messrs. Peacock and Buchan, which, for *economy* and efficiency, has now been *established* for upwards of *Twenty-Five Years*—unrivalled.

Amongst other ingredients tried by theorists may be mentioned the following heterogeneous list, viz: Asafœtida, ammonia, aloes, strychnine, cyanide of potassium, plumbago, prussiate of potash, mercurial ointment, castor oil, soft soap, soap refuse, tobacco juice, Naples soap, yellow soap, pepper, verdigris, phosphorus paste, caoutchouc, parraffine, pimento, ginger, gutta percha, barytes, borax, copper slag, clays of all kinds, Thames mud and lime mixed with tar, varnish or creosote, sulphur, pumice stone, gunpowder, charcoal, saltpetre and natron, mustard and capsicums, magnesia, brimstone and treacle, Chenam chalk, cook's slush, tallow and arsenic, tallow and white lead, tallow, and chalk, or zinc powder; cements, gums and resins of all kinds, Burgundy pitch, cobbler's wax, marine glue, Battle's powder, nux vomica, essential oils with snuff, asphaltum, petroleum, emery, brick dust, brass filings, powdered glass, granulated metals of all kinds mixed with linseed oil, turpentine, pine varnish, bitumen, &c., such as arsenic, manganese, tin, zinc, lead, mercury, antimony and copper, both raw and as sub-oxides, per-oxides, arsenites, iodides, sulphates, &c., indeed in every chemical form; also sheet glass and enamelled plates—the latter accumulating barnacles quicker than anything!

Peruvian guano, Glauber's salts, nitrate of soda and dried cow dung have also been tried, mixed in linseed oil, with some fifty other absurdities, for which over a hundred patents have been taken out, and the whole of which mixtures or materials, more or less, have failed to effect the object intended, whilst many of them, particularly those of copper, arsenic, and mercury, have in many instances done positive injury to the plates and rivets.

"Ay, me! what perils do environ
The man that meddles with cold iron!
What plaguy mischief and mishaps
Do dog him still with after-claps."

"*Hudibras*," *Canto third.*

The first iron vessel of which we have any record was a canal barge constructed in the year 1787, and the first iron sea going ship was built by the Horsley Iron Company in the year 1821. In the same year an iron vessel of considerable tonnage was constructed at Rotherhythe, on the Thames, very flat-bottomed for navigating the Seine.

In 1824 Mr. Grantham, C.E., navigated an iron steamer on the Shannon. In 1835 numerous iron steamers were built on the Clyde.

and from 1840 to 1847 several large vessels, both sailing ships and steamers, were constructed of this material principally by Messrs. Fairbairn; but the rapidity with which "fouling" took place on the red lead and arsenic, then considered to be the best panacea, both as an anticorrosive as well as an *antifouler*, became so serious as to interfere materially with the building of iron ships, particularly in the Royal Navy, where it was indeed contemplated about this time to get rid of all the iron Government ships and build no more—a somewhat similar resolve to that of the Commissioners of the Navy in 1783, when the destruction of the iron fastenings by galvanic action was thought to be fatal to the use of copper sheathing, until a proper remedy had been suggested.

Mr. Peacock, the senior partner of the firm of Peacock & Buchan, turned his attention to this important subject at a very early period. After commanding a copper-sheathed ship out of Starcross (port of Exeter), in the Brazil trade for some time, he passed his examination, and joined the Royal Navy, as a Second Master and Naval Pilot, in the year 1828. He had from the year 1820 observed the rapid fouling which took place on the bottoms of French, Italian, and Austrian vessels at Genoa, Malta, Trieste, Marseilles, Naples, &c , these vessels being coated with brimstone and tallow; he also studied the sciences of metallurgy, marine surveying, and the principles of the Marine Steam Engine, &c., from the year 1823, working as an amateur in the engine-room of the steamer "Favourite," then running to and from Margate and London, and subsequently in the Factory of Messrs. Maudsley and Sons, of Lambeth. Mr. Peacock was appointed Second Master and Pilot in June, 1828, to the first steamer that ever hoisted a pendant under *Admiralty* Commission,† namely the "Echo," commanded by Lieut-Commander Frederick Bullock, R.N., now a full Admiral, residing near Woolwich, and did the duty of Master Pilot, and First Lieutenant for nearly two years, the "Echo" being employed in surveying the river Thames, and practically establishing Dr. Whewell's theory of the Tides; also in carrying despatches to Gibraltar, Lisbon, &c.

---

† The first steamers built for the Government were the "Lightning" and "Comet," and were commissioned under the *Navy Board*.

Mr. Peacock, through the interest of Lord Mark Kerr, went out to the West Indies on promotion in 1830 in H.M.S. "Winchester," and was employed in surveying the Isthmus of Panama, and the coast of Nicaragua and Harbour of S. Juan, where he made some important hydrographical discoveries, and suggested the most feasible spots for a railway and canal. He afterwards served as Master of H.M. Steam vessels "Salamander" and "Medea," with the late Sir Horatio T. Austin, C.B. for many years, where he carried out several of his practical inventions, *at his own expense*, for the benefit of the Service, without fee or reward.

In 1838 he began a series of experiments at Bermuda, for the preservation of iron ships and prevention of "fouling," and continued these experiments at Valparaiso and Callao, from 1840 to 1846, with pigments composed of different metallic oxides, namely, of arsenic, copper, antimony, zinc, and mercury, particularly those of *copper* in various forms, also powdered metallic copper itself; and although he obtained tolerably good results as to keeping off weed and barnacles for a considerable period of time, yet he found the action of the *copper* injured the plates of iron, notwithstanding that every precaution was taken to protect the surface by previous coatings of coal-tar, bitumen and naphtha, red lead, zinc, &c.; for wherever abrasion occurred, there *galvanic action* took place, and the surface of the iron in the course of a few months became more or less honey-combed, and no doubt would eventually have been eaten through. Antimony, zinc, red lead, or white lead alone did not injure the iron, but got very foul. Preparations of m
also ascertained to be very destructive.

On his return to England in 1846, he continued his
at Starcross (mouth of the Exe), by nailing iron plates co
ious metallic mixtures to the piles of the landing c

rarely uncovered by the tide: these plates were a foot square, and had numbers stamped on them to prevent mistakes; but he found, on examination from time to time, the same results as at Callao, namely, that *all* the preparations containing *copper* or *mercury* in *any form* acted injuriously on the iron; for notwithstanding they kept clean in different degrees relatively, wherever the least abrasion or rubbing up of the under coating had taken place, they were invariably corroded and partially honey-combed; whilst those plates that had only red lead, white lead, arsenic, iron paint, zinc, black lead and antimony, coal tar, asphaltum, &c., &c., soon became foul (in five or six weeks).

During that, and the following year, 1847, he commenced a new series of experiments, founded upon an entirely different hypothesis, discarding all deleterious compounds totally from his mixtures, and happily succeeded (with the subsequent active and practical co-operation of Mr H. J. Buchan, of Southampton), in establishing a Composition, which not only kept clean for a longer period than any other known or *newly patented* Nostrum containing *copper*, *mercury*, *&c.*, but also preserved the surface of the iron plates and rivet heads, and contributed to accelerate the speed of the vessel by producing an unctuous surface, like the back of a fish.

The simple elements composing this *economical* Composition contain no pernicious properties whatever in themselves, the active quality being evolved by the salt water converting their bases into an anti-fouling *mucous*—thus presenting a *slippery* exfoliating surface, destructive to animal and vegetable life. This slimy surface, which is being constantly renewed by chemical action under water, until the materials in the Composition are exhausted, is somewhat analagous to the coating secreted by fishes, such as the whale, porpoise, &c., for it is a fact well known to whalers, that old fish, when they lose the property of secreting this slimy material, become covered with barnacles and die.

The great impetus given to Iron Ship-building since this impor-

TANT DISCOVERY has induced Messrs. PEACOCK and BUCHAN to issue this NINTH Edition of their Pamphlet, in order to place some of their recent and early Testimonials before the Public; and they respectfully beg to call the attention of *Iron Ship-builders*, the *Directors of Great Steam Companies*, and *Ship Owners* in general, to the contents of this Pamphlet, so that the *prejudice* so long existing against Iron Ships from fouling may now be entirely removed.

The return of numerous Iron Vessels from Indian and Australian Voyages in excellent condition, after being coated with this *anti-fouling* Composition, has solved a great problem in the application of Iron for the manufacture of Ships intended for long Sea Voyages. *Vide Bourne's Treatise on the Screw Propeller*, Appendix, p xxxiv—vi, published in 1851.

An Iron Ship receiving *two* coats of PEACOCK & BUCHAN's No. 2 Anti-fouling Composition before leaving England, which can be appplied in less time than that required for ordinary painting, and taking with her a small quantity hermetically sealed in an Iron Cask, for re-touching between wind and water on arrival out, and occasionally whilst coaling, where it may be rubbed off by lighters, &c., will *make the voyage to India, Australia, or California, without the necessity of docking in the country*, and this Composition *not* having the *least particle of Copper* in it, no galvanic action, to the prejudice of the Iron, can possibly take place.

N.B.—Instances have occurred that where preparations containing copper have been used, and rubbed off in parts, holes have been eaten through the plates by galvanic action, and the rivets destroyed. Numbers of iron ships, apparently tight, staunch, and strong on leaving port, have suddenly foundered at sea in a mysterious manner,—ignorantly attributed to over-loading and intentional unseaworthiness!

The following extract is from a paper read by Mr. Reed, the late chief Constructor of the navy at the Institution of Naval Architects, 26th March, 1863.

Mr. Reed said, "At our very first meeting, Mr. Scott Russel, in one of the ablest speeches ever delivered upon iron ships made this remarkable statement: he said, 'The surveyors of Lloyds looked over a ship with me the other day, which ship I think was only five years old; and in the middle body and at the bottom of the ship, the number of rivets that had entirely disappeared was to me astounding. I leave it to wiser men than I am,' he added, 'to find out why they were gone. But the rivet heads *were* gone. . . . . A thousand rivets, were gone.' One of Lloyds chief Surveyors, Mr. Martin, a gentleman of unequalled experience in speaking of the deterioration of iron ships then, said, 'We have had in some cases to replace the whole plating of a bottom which was fourteen sixteenths in thickness, some of the plates being entirely wasted through at an early age, the rivet heads being entirely gone, and the edges of the plating wasted away to the first row of rivets."

From the Shipping and Mercantile Gazette of 25th January, 1872.

THE LATE STEAM TRANSPORT MEGÆRA.

To the Editor of the *Shipping and Mercantile Gazette.*

Sir,—Having been largely connected with Iron Shipping for many years, I have naturally taken a great deal of interest in the evidence brought before the Royal Commission (so ably reported in the columns of the *Shipping and Mercantile Gazette)* in the case of H.M. late iron steam transport Megæra, which still drags its weary course along almost as heavily as the Tichborne case. Witness after witness is call to develope the management, or mismanagement rather of Dockyard officials, Naval Constructors, &c., and at length it has been proved by experiment at Portsmouth Dockyard that there *is* such a thing as galvanic action, and that copper and iron in salt water are antagonistic to each other —a fact well-known to ordinary capacities for more than a century, and for many years established at No. 2, White Lion-court, Cornhill; but, as an old practical Ship's Husband, it does seem odd to me that no questions have yet been asked as to what this unfortunate "no man's child" had been cemented or coated with on the outside, as well as the inside; because, although copper pipes and rose boxes in the bilges may and do corrode the inside of the iron plates, and eat off the heads of the rivets, also destroy the girders or frames, when they are not properly cemented, and said pipes are not woulded with spunyarn covered with canvas and tarred over, which ought always to be done to prevent galvanic action, yet this inner corrosion will not account for that on the outside.

Bell, the diver, stated that he found "five or six plates from the keel upwards, from about a foot abaft the leak to 10 feet before it very rusty," also that "about 10 feet abaft the leak there was a patch of rust about 12 feet by 5;" that "the corners of two overlapping plates were eaten away near the bad plate, and the lower edges of the two corners were either rusted away or knocked away to the extent of 4 inches along the plate, and 1½ inch up the ends;" that "he could have easily picked through the rusty iron left with his knife, but thought it was not right to do so," &c. "that there were many plates which, from the outside appearance of the ship's side, seemed decayed—more than three or four dozen places of apparent decay;" "he would say he saw hundreds of such places." Captain Thrupp said "he regarded these spots as places which were little short of leaks; and further remarked that, "as the rusty places extended 14 feet in length by 5 or 6 plates in breadth, where the diver went down, we had every reason to suppose that there was very little in those parts but bricks and cement between us and the sea;" moreover on the ship beaching, the water bubbled up through the fore part of the stoke hole. One of the Engineers in his examination, stated that, "when the ship was docked at Sheerness, the bottom was cleaned and coated with composition, where it (the composition) was worn off." He does not say, nor is he asked, what was the nature of this composition; no doubt it was a preparation of *copper*! Indeed it is well-known to have been so in the dockyards.

A retired Master Shipwright, of one of the Royal Dockyards, stated that "in 1862 he pointed out an appearance which he now belived to have been an abrasion which at the time, it was stated in the report 'for which we cannot account:' this patch was 3 or 4 feet in extent, and was very much corroded; it was opposite the mainmast on the outside." "He was aware of the Admiralty order against copper being allowed to come in contact with iron, and this order, he believed, was complied with;" but it would seem that neither this gentleman, nor any one else connected with the Dockyards or the Admiralty, thought the nature of the composition used by the iron ships of the Royal Navy, worthy of being inquired into relative to this important and sensible order, although this oxide of copper, the scales of sheet copper manufactured in Chatham Dockyard by grinding into copper-dust and mixing with bitumen, was well known to be almost exclusively used on the bottoms of H.M. iron ships; and, when they were docked to have the barnacles and weeds removed, the oxydised or corroded portions of their bottoms were naturally filled up with solid bitumen, forming "an enamelled surface" before applying the preparation of copper as a finishing coat. No doubt there might have been some portions of the Megæra's bottom where, in scraping off the bitumen for examination, the original red lead appeared, as stated by one of the witnesses, but, of course, over such places the under bituminous coating had remained intact; but where abrasion or flaking off had taken place, exposing the surface of the naked iron, the surrounding surface of copper would naturally form a galvanic battery and corrode away the surface, and which the Surveyors, having no idea of galvanic action, would as naturally declare "they could not account for!" It certainly does seem singular that it has never occurred to the Commisioners, as yet, to inquire into the nature of the composition used on the Megæra.

At a meeting held in the theatre of the R. U. S. Museum, on March 20, 1865, Captain Warren, R.N., read a letter from Capt, Madden, R.N., who had commanded the Megæra in a former commission, dated February 24, 1854, wherein he stated that "she was coated on one side with Hay's composition, and on the other with M'Innes', and that both seemed to him to be totally inefficient," although he did not venture a word on galvanic action; but Captain Selwyn, R.N., on that occasion (see minutes of the meeting), animadverted on the galvanic question at *that* time and stated—"that whenever you put copper and iron together exposed to the water of the sea, there you will inevitably have a strong galvanic action." He added —"There is no known means of stopping that;" "salt water is the conductor to to continue galvanic action through."

This fact is well known to Merchant Shipowners, and although this copper preparation, I am told, is still used on many of her Majesty's ships it is never used in the Merchant Navy, where iron ships do not decay "from old age" when properly looked after, and are kept free from galvanic action; indeed thin plates, decayed rivets, and *new* bottoms are seldom or never heard of now.

Yours, &c., A SHIP'S HUSBAND.

Blackwall, January 22nd, 1872.

(I beg to enclose my Card.)